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MATERIAL CULTURES OF THE NORTH AMERICAN INDIANS

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FOR some years the study of material culture has been quite out of fashion, though not so very long ago it was otherwise. Field-workers still record such random data as come to hand and gather up museum specimens, but give their serious and systematic attention to language, art, ceremonies, and social organization. As a result we have accumulated certain stimulating and serviceable conceptions which serve as a basis for the further development of these problems. On the other hand, there is little of this character to record for material culture, so that if we give our attention strictly to a review of progress, the task will be light. In consequence, we have chosen to review briefly the data for North American material culture and then present some of the most obvious general problems that are suggested.

The description of a tribe's material culture, to be regarded as adequate, should give reasonably full data on the points enumerated in our topical list. Such a list might well serve as a guide to field-work and also as an outline for the published reports. In the preparation of this outline we have been guided entirely by practical considerations rather than by logical relations. Thus the order of topics and their divisions have no scientific significance, but are such as justify themselves to us as the most convenient.

The thorough treatment of our subject would require taking up in succession the three hundred or more tribes known to us and reviewing their culture in detail. Unfortunately, we have very meager data on many points, but on the whole this outline can be more completely filled in for all these tribes than similar ones for their social and ceremonial cultures. For some tribes we have special papers treating most phases of their material cultures, but the bulk of our information is scattered here and there among books of travel and exploration. Most of these data are still awaiting the ethnological student, yet we have now available in the readily accessible literature an *extensive* knowledge of the continent that is sufficient for a brief general discussion of our subject.

TOPICAL LIST OF DATA NEEDED TO CHARACTERIZE THE MATERIAL CULTURE OF AN AMERICAN TRIBE

1. Food: *a*, methods of gathering and producing vegetable foods; *b*, hunting; *c*, fishing; *d*, agriculture and domestication; *e*, methods of cooking; *f*, manufactured foods. (Details of methods and appliances in every case.)
2. Shelter: details of structure for (*a*) seasonal types; (*b*) permanent types, and (*c*) temporary shelters.
3. Transportation: methods and appliances for land and water.
4. Dress: materials and patterns; sex differences, *a*, headgear and hair dress; *b*, foot gear; *c*, hand gear; *d*, body costume; *e*, over-costume.
5. Pottery: methods of manufacture, forms, uses, colors, technique of decoration.
6. Basketry, mats, and bags: materials, kinds of weave, forms, uses, technique of color and decoration.
7. Weaving of twisted elements: materials, methods of twisting thread and cord, weaving frames or looms, technique of dyeing and pattern-weaving, kinds and uses of products.
8. Work in skins: *a*, dressing, methods and tools; *b*, tailoring and sewing; *c*, technique of bags and other objects; *d*, use of rawhide.
9. Weapons: bows, lances, clubs, knives, shields, armor, fortifications, etc.
10. Work in wood: *a*, methods of felling trees, making planks and all reducing processes; *b*, shaping, bending and joining; *c*, drilling, sawing, smoothing,

d, painting and polishing; *e*, use of fire; *f*, tools; *g*, list of objects made of wood; *h*, technique of carving.

11. Work in stone: processes, forms, and uses.
12. Work in bone, ivory, and shell.
13. Work in metals.
14. Feather-work, quill technique, bead technique, and all special products not enumerated above.

DISTRIBUTION OF MATERIAL TRAITS

One cannot take up problems in the distribution of material traits in America without acknowledging the extensive work of the late O. T. Mason. Though deeply interested in logical classification and genetic problems he rarely permitted these conceptions to obscure the geographical relations of traits. Thus no matter what points of view may ultimately prevail in anthropology, his works will stand at the head of the reference list.

Culture Areas

It is customary to divide the continent into culture areas the boundaries to which are provisional and transitional, but which taken in the large enable us to make convenient distinctions. North of Mexico we have nine culture areas: the Southwest, California, the Plateaus, the Plains, the Southeast, the Eastern Woodlands, the Mackenzie, the North Pacific Coast, and the Arctic areas. Each of these is conceived as the home of a distinct type of culture; but when we take a detailed view of the various tribal groups within such an area we find a complex condition not easily adjusted to a generalized type.

Plains Area. In the Plains area we have at least thirty-one tribal groups, of which eleven may be considered as manifesting the typical material culture of the area.—The Assiniboine, Arapaho, Blackfoot, Crow, Cheyenne, Comanche, Gros Ventre, Kiowa, Kiowa-Apache, Sarsi, and Teton-Dakota. The chief traits of this culture are the dependence upon the buffalo and the very limited use of roots and berries; absence of fishing; lack of agriculture; the tipi as a movable dwelling; transportation by land only with the dog and the travois (in historic times with the horse); want of basketry and pottery; no true weaving; clothing of buffalo and deerskins; a special bead technique; high development of work in skins; special rawhide work (parfleche, cylindrical bag, etc.); use of a circular shield; weak development of work in wood, stone, and bone.

In historic times these tribes ranged from north to south in the heart of the area. On the eastern border were some fourteen tribes having most of the positive traits enumerated above and in addition some of the negative ones, as a limited use of pottery and basketry, some spinning and weaving of bags, rather extensive agriculture and alternating the tipi with larger and more permanent houses covered with grass, bark, or earth, some attempts at water transportation. These tribes are: the Arikara, Hidatsa, Iowa, Kansa, Mandan, Missouri, Omaha, Osage, Oto, Pawnee, Ponca, Santee-Dakota, Yankton-Dakota, and the Wichita.

On the western border were other tribes (the Wind River Shoshone, Uinta and Uncompahgre Ute) lacking pottery, but producing a rather high type of basketry, depending far less on the buffalo but more on deer and small game, making large use of wild grass seeds, or grain, alternating tipis with brush and mat-covered shelters.

Also on the northeastern border are the Plains-Ojibway and Plains-Cree who have many traits of the forest hunting tribes as well as most of those found in the Plains. Possibly a few of the little-known bands of Canadian Assiniboine should be included in this group in distinction from the Assiniboine proper.

These variations from the type are, as we shall see, typical traits of the adjoining areas, the possible exception being the earth-lodges of the Mandan, Pawnee, etc. On the other hand, the tribes of the area as a whole have in common practically all the traits of the typical group.[1] For example, the Mandan made some use of tipis, hunted buffalo, used the travois, worked in skins and rawhide, and armed and clothed themselves like the typical Plains tribes, but also added other traits, pottery, basketry, agriculture, and earth-lodges. Thus we see that while in this area there are marked culture differences, the traits constituting these differences tend to be typical of other areas and that, hence, we are quite justified in taking the cultures of the central group as the type for the area as a whole.[1]

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[1] The reader should bear in mind that all the interpretations and assumptions in this paper are limited absolutely to the bounds of material culture and that no consideration is given to the applicability of the several conclusions to other aspects of culture. Hence, the word *culture*, unless otherwise stated, is to be taken as excluding all traits not enumerated in the topical list.

Plateau Area. The Plateau area joins the Plains on the west. It is far less uniform in its topography, the south being a veritable desert while the north is moist and fertile. To add to the difficulties in systematically characterizing this culture, arising from lack of geographical unity, is the want of definite information for many important tribes. Our readily available sources are Teit's Thompson, Shushwap, and Lillooet; Spinden's Nez Percé; and Lowie's Northern Shoshone; but there is also an excellent summary of the miscellaneous historical information by Lewis. In a general way, these three intense tribal studies give us the cultural nuclei of as many groups, the Interior Salish, the Shahaptian, and the Shoshone. Of these the Salish seem the typical group because both the Nez Percé and the Shoshone show marked Plains traits.[2] It is also the largest, having sixteen or more dialectic divisions and considerable territorial extent. Of these the Thompson, Shushwap, Okanagan (Colville, Nespelim, Sanpoil, Senijixtia), and Lillooet seem to be the most typical. The traits may be summarized as: extensive use of salmon, deer, roots (especially camas), and berries; the use of a handled digging-stick, cooking with hot stones in holes and baskets; the pulverization of dried salmon and roots for storage; winter houses, semi-subterranean, a circular pit with a conical roof and smoke hole entrance; summer houses, movable or transient, mat or rush-covered tents and the lean-to, double and single; the dog sometimes used as a pack animal; water transportation weakly developed, crude dug-outs and bark canoes being used; pottery not known; basketry highly developed, coil, rectangular shapes, imbricated technique; twine weaving in flexible bags and mats;

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[1] Consult: Wissler, (*a*), (*b*), (*c*).

[2] Consult: Lewis; Teit, (*a*), (*b*), (*c*); Spinden; Boas, (*b*); Hill-Tout; Lowie.

some simple weaving of bark fiber for clothing; clothing for the entire body usually of deerskins; skin caps for the men, and in some cases basket caps for women; blankets of woven rabbitskin; the sinew-backed bow prevailed; clubs, lances, and knives, and rod and slat armor were used in war, also heavy leather shirts; fish spears, hooks, traps, and bag nets were used; dressing of deerskins highly developed but other skin work weak; upright stretching frames and straight long handled scrapers; while wood work was more advanced than among the Plains tribes it was insignificant as compared to the North Pacific Coast area; stone work was confined to the making of tools and points, battering and flaking, some jadeite tools; work in bone, metal, and feathers very weak.

The Shahaptian group includes tribes of the Waiilatpuan stock. The underground house seems to be wanting here, but the Nez Percé used a form of it for a young men's lodge. However the permanent house seems to be a form of the double lean-to of the north. In other respects the differences are almost wholly due to the intrusion of traits from the Plains. Skin work is more highly developed and no attempts at the weaving of cloth are made, but there is a high development of basketry and soft bags.

The Northern Shoshonean tribes were even farther removed toward Plains culture, though they used a dome-shaped brush shelter before the tipi became general; thus, they used canoes not at all, carried the Plains shield; deer being scarce in their country they made more use of the buffalo than the Nez Percé, depended more upon small game and especially made extensive use of wild grass seeds, though as everywhere in the area, roots and salmon formed an important food; in addition to the universal sagebrush bark weaving they made rabbitskin blankets; their basketry was coil and twine, but the shapes were round; they had some steatite jars and possibly pottery, but usually cooked in baskets; their clothing was quite Plains-like and work in rawhide was well developed; in historic times they were great horse Indians but seem not to have used the travois either for dogs or horses. The remaining Shoshone of western Utah and Nevada were in a more arid region and so out of both the salmon and the buffalo country, but otherwise their fundamental culture was much the same, though far less modified by Plains traits. The Wind River division, the Uinta or Uncompahgre Ute, it should be noted, belong more to the Plains area than here, and have been so classed. In the extreme western part of Nevada we have the Washo, a small tribe and linguistic stock, who in common with some of the little-known Shoshonean Mono-Paviotso groups seem to have been influenced by California culture. Among other variants, their occasional use of insects as food may be noted. On the north of our area are the Athapascan Chilcotin whose material culture was quite like that of the Salish, and to the northeast the Kutenai with some individualities and some inclinations toward the Plains.

In general, it appears that in choice of foods, textile arts, quantity of clothing, forms of utensils, fishing appliances, methods of cooking and preparing foods, there was great uniformity throughout the entire area, while in houses, transportation, weapons, cut and style of clothing, the groups designated above presented some important differences. As in the Plains area we find certain border tribes strongly influenced by the cultures of the adjoining areas.

California Area. In California we have a marginal or coast area, which Kroeber divides into four sub-culture areas. However, by far the most extensive is the central group to which belongs the typical culture. Its main characteristics are: acorns, the chief vegetable food, supplemented by wild seeds, roots and berries scarcely used; acorns made into bread by a roundabout process; hunting mostly for small game and fishing where possible; houses of many forms, but all simple shelters of brush or tule, or more substantial conical lean-to structures of poles; the dog was not used for packing and there were no canoes, but used rafts of tule for ferrying; no pottery but high development of basketry, both coil and twine; bags and mats very scanty; cloth or other weaving of twisted elements not known; clothing was simple, and scanty, feet generally bare; the bow, the only weapon, sinew-backed usually; work in skins very weak; work in wood, bone, etc., weak; metals not at all; stone work not advanced. With the single exception of basketry we have here a series of simple traits which tend to great uniformity.

As with the preceding areas we must again consider intermediate groups. In the south the characteristic linguistic individuality vanishes to make room for large groups of Yuman and Shoshonean tribes; here we find some pottery, sandals, wooden war clubs, and even curved rabbit sticks, all intrusive. The extinct Santa Barbara were at least variants, living upon sea food, having some wood work, making plank canoes, and excellent workers of stone, bone, and shell. In northern California are again the Karok, Yurok, Wishosk, Shasta, and Hupa and other Athapascan tribes; here sea food on the coast and salmon in the interior rival acorns and other foods; dug-out canoes; rectangular gabled houses of planks with circular doors; basketry almost exclusively twined; elkhorn and wooden trinket boxes; elkhorn spoons; stone work superior to that of central California; the occasional use of rod, slat, and elkskin armor and also basket hats of the northern type. These all suggest the culture farther north.[1]

North Pacific Coast Area. Ranging northward from California to the Alaskan peninsula we have an ethnic coast belt, known as the North Pacific Coast area. This culture is rather complex and presents highly individualized tribal variations; but can be consistently treated under three subdivisions: (a) the northern group, Tlingit, Haida, and Tsimshian; (b) the central group, the Kwakiutl tribes and the Bellacoola; and (c) the southern group, the Coast Salish, the Nootka, the Chinook, Kal̓apooian, Waiilatpuan, Chimakuan, and some Athapascan tribes. The first of these seem to be the type and are characterized by: the great dependence upon sea food, some hunting upon the mainland, large use of berries; dried fish, clams, and berries are the staple food; cooking with hot stones in boxes and baskets; large rectangular gabled houses of upright cedar planks with carved posts and totem poles; travel chiefly by water in large sea-going dug-out canoes some of which had sails; no pottery nor stone vessels, except mortars; baskets in checker, those in twine reaching a high state of excellence among the Tlingit; coil basketry not made; mats of cedar bark and soft bags in abundance; the Chilkat, a Tlingit tribe, specialized in the weaving of a blanket of goat hair; there was no true loom, the warp hanging from a bar and weaving with the fingers, downward; clothing rather scanty, chiefly of skin, a wide basket hat (only one of the kind on the continent and apparently for rain protection); feet usually bare, but skin moccasins and leggings were occasionally made; for weapons the bow, club, and a peculiar dagger, no lances; slat, rod, and skin armor; wooden helmets, no shields; practically no chipped stone tools, but nephrite or green stone used; wood work highly developed, splitting and dressing of planks, peculiar bending for boxes, joining by securing with concealed stitches, high development of carving technique; work in copper may have been aboriginal, but, if so, very weakly developed.

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[1] Consult: Kroeber, (*a*). Also the special anthropological publications of the University of California.

The central group differs in a few minor points; use a hand stone hammer instead of a hafted one, practically no use of skin clothing but twisted and loosely woven bark or wool; no coil or twined basketry, all checker work.

Among the southern group appears a strong tendency to use stone arrowheads in contrast to the north; a peculiar flat club, vaguely similar to the New Zealand type, the occasional use of the Plains war club, greater use of edible roots (camas, etc.) and berries, some use of acorns as in California, the handled digging-stick, roasting in holes (especially camas) and the pounding of dried salmon, a temporary summer house of bark or rushes, twine basketry prevailed, the sewed rush mat, costume like the central group.[1]

Eskimo Area. The chief résumés of Eskimo culture have been made by Boas who divides them into nine or more groups, but his distinctions are based largely upon non-material traits. When we consider the fact that the Eskimo are confined to the coast line and stretch from the Aleutian islands to eastern Greenland, we should expect lack of contact in many parts of this long chain to give rise to many differences. While many differences do exist, the similarities are striking, equal if not superior in uniformity to those of any other culture area. However, our knowledge of these people is far from satisfactory, making even this brief survey quite provisional.

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[1] Consult: Boas, (*c*), (*d*); Krause; Niblack; Emmons, (*a*), (*b*), (*c*).

The mere fact that they live by the sea and chiefly upon sea food, will not of itself differentiate them from the tribes of the North Pacific coast; but the habit of camping in winter upon sea ice and living upon seal, and in the summer upon land animals will serve us. Among other traits the kayak and "woman's boat," the lamp, the harpoon, the float, woman's knife, bowdrill, snow goggles, the trussed-bow, and dog traction, are almost universal and taken in their entirety rather sharply differentiate Eskimo culture from the remainder of the continent. The type of winter shelter varies considerably, but the skin tent is quite universal in summer, and the snow house, as a more or less permanent winter house, prevails east of Point Barrow. Intrusive traits are also present: basketry of coil and twine is common in Alaska;[1] pottery also extended eastward to Cape Parry; the Asiatic pipe occurs in Alaska and the Indian pipe on the west side of Hudson bay; likewise some costumes beaded in general Indian style have been noted west of Hudson bay. All Eskimo are rather ingenious workers with tools, in this respect strikingly like the tribes of the North Pacific coast. In Alaska where wood is available the Eskimo carve masks, small boxes, and bowls with great cleverness.

These variants all tend to disappear between Point Barrow and Hudson bay and it may be noted that they are at the same time traits that occur in Asia, the North Pacific coast, or the Mackenzie area. Hence, we seem justified in looking toward the east for the typical material culture. From our limited knowledge it appears that the great central group from Banks land on the west to Smith sound in North Greenland is the home of the purest traits; here are snow houses, dogs harnessed with single traces, rectangular stone kettles; and the almost entire absence of wooden utensils.[2] In Greenland and Labrador the differences are small and apparently due more to modern European influences than to prehistoric causes.

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[1] Mason asserts the occasional occurrence of coil baskets among the Central group.

[2] Consult: Boas, (*e*), (*f*), (*g*), (*h*); Murdoch; Nelson, E. W.

The limited study of archeological specimens by Dall, Solberg, and Boas suggests much greater uniformity in the prehistoric period, a conclusion apparently borne out by the collections made by Stefânsson on the north coast. While this is far from conclusive, it is quite consistent with the view that the chief intrusive culture is west of the Mackenzie river.

Mackenzie Area. Skirting the Eskimo area from east to west is a great interior belt of semi-Arctic lands, including the greater part of the interior of Canada. Hudson bay almost cuts it into two parts, the western or larger part occupied by the Déné tribes, the eastern by Algonkins, the Saulteaux, Cree, Montagnais, and Naskapi. The fauna, flora, and climate are quite uniform for corresponding latitudes which is reflected to some extent in material culture so that we should be justified in considering it one great area;[1] this would, however, not be consistent with less material traits according to which the Déné country is considered as a distinct area. For this reason we shall treat the region under two areas.

Our knowledge of the Déné tribes is rather fragmentary, for scarcely a single tribe has been seriously studied. Aside from the work of Father Morice we have only the random observations of explorers and fur traders. It is believed that the Déné tribes fall into three culture groups. The eastern group: the Yellow Knives, Dog Rib, Hares, Slavey, Chipewyan, and Beaver; the southwestern group: the Nahane, Sekani, Babine, and Carrier; the northwestern group comprising the Kutchin, Loucheux, Ahtena, and Khotana.

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[1] The chief cultural bond through this region is the use of the caribou. The caribou ranged from Maine to Alaska and throughout all this area furnished the greater part of the clothing and tents and a considerable portion of the food. They could not be taken easily in summer but in winter were killed in drives, on the ice, or after a thaw, in the water. They were also snared. All of these methods were known from Alaska to Newfoundland. Between the Mackenzie and Hudson bay ranged the barren ground variety, whose habits were somewhat like those of the buffalo on the Plains, and the tribes in reach of their range lived upon them almost as completely as did the Indians of the Plains upon the buffalo. (See Pike, chap. 4; for map see Madison Grant in the *Seventh Annual Report, New York Zoological Society.*) Along with these widely distributed caribou traits go the great use of spruce and birchbark for canoes and vessels, babiche, and bark fiber, toboggans, and skin or bark-covered tents, the use of snares and nets.

The Chilcotin are so far removed culturally that we have placed them in the Plateau group and the Tahltan seem to be intermediate to the North Pacific center.

Of these three groups the southwestern is the largest and occupies the most favorable habitat. From the writings of Father Morice a fairly satisfactory statement of their material cultures can be made, as follows: All the tribes are hunters of large and small game, caribou are often driven into enclosures, small game taken in snares and traps; a few of the tribes on the headwaters of the Pacific drainage take salmon, but other kinds of fish are largely used; large use of berries is made, they are mashed and dried by a special process; edible roots and other vegetable foods are used to some extent; utensils are of wood and bark; no pottery; bark vessels for boiling with and without use of stones; travel in summer largely by canoe, in winter by snowshoe; dog sleds used to some extent, but chiefly since trade days, the toboggan form prevailing; clothing of skins; mittens and caps; no weaving except rabbitskin garments,[1] but fine network in snowshoes, bags, and fish nets, materials of bark fiber, sinew, and babiche; there is also a special form of woven quill work; the typical habitation seems to be the double lean-to, though many intrusive forms occur; fish-hooks and spears; limited use of copper; work in stone weak.[2]

Unfortunately, the data available on the other groups are less definite, so that we cannot decisively classify the tribes. From Hearne, Mackenzie, and others it appears that the following traits prevailed over the entire Déné area: the twisting of bark fiber without spindle and its general use, reminding one of sennit; snares and nets for all kinds of game; the use of spruce and birchbark for vessels and canoes; basketry of split spruce root (*watap*) for cooking with hot stones noted by early observers; the toboggan; in summer the use of the dog to carry tents and other baggage; extensive use of babiche; the short-handled stone adze; iron pyrites instead of the firedrill and fungus for touchwood; the use of the cache; and above all, dependence upon the caribou. These seem to be the most characteristic traits of the Déné as a whole and while neither numerous nor complex are still quite distinctive.

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[1] These are often woven on a frame similar to the skin-dressing frame but without loom-like appliances.

[2] The following statement as to the archeology of the southwestern group may be noted:

"Throughout the whole extent of their territory, no mounds, enclosures, fortifications of a permanent character or any earthen works suggesting human agency are to be found, nor is their existence, past or present, even as much as suspected by any Carrier, Tsē'kēhne or Tsikoh'tin. In the same manner, pottery, clay implements, perforated stones, mortars, ceremonial gorgets, gouges, stone sledges and articles of shell either plain, carved, or engraved, have to this day remained unknown among them. They did formerly, and do still occasionally, use stone pestles. But for the mortars common among natives of most heterogeneous stocks, they substitute a dressed skin spread on the ground whereon they pound dried salmon, salmon vertebrae, bones, etc." (Morice, *a*, 35.)

Some writers have commented upon the relative poverty of distinctive traits and the preponderance of borrowed, or intrusive ones. For example, the double lean-to is peculiarly their own, though used slightly in parts of the Plateau area; but among the southwestern Déné we frequently find houses like those of the Tsimshian among the Babine and northern Carrier, while the Skena and southern Carrier use the underground houses of the Salish, and among the Chipewyan, Beaver, and most of the eastern group, the skin or bark-covered tipi of the Cree is common. Similar differences have been noted in costume and doubtless hold for other traits. Pemmican was made by the eastern group. According to Hearne some of them painted their shields with Plains-like devices. In the northwestern group we find some sleds of Eskimo pattern. Such borrowing of traits from other areas is, however, not peculiar to the Déné, and while it may be more prevalent among them, it should be noted that our best data is from tribes marginal to the area. It is just in the geographical center of this area that data fail us. Therefore, the inference is that there is a distinct type of Déné culture and that their lack of individuality has been overestimated.[1]

Eastern Woodland Area. We come now to the so-called Eastern Woodland area, the characterization of which is difficult. As just noted, its northern border extends to the Arctic and all the territory between the Eskimo above and Lakes Superior and Huron below and eastward to the St Lawrence is the home of a culture whose material traits are comparable to those of the Déné. In brief, the traits are the taking of caribou in pens; the snaring of game; the considerable use of small game and fish; the use of berry food; the weaving of rabbitskins; the birch canoe; the toboggan; the conical skin or bark-covered shelter; the absence of basketry and pottery; use of bark and wooden utensils. The tribes most distinctly of this culture are the Ojibway north of the Lakes, including the Saulteaux, the Wood Cree, the Montagnais, and the Naskapi.

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[1] Consult: Morice, (*b*), (*c*); Mackenzie; Hearne; Emmons, (*c*).

Taking the above as the northern group we find the main body falls into three large divisions:

1. The Iroquoian tribes (Huron, Wyandot, Erie, Susquehanna, and the Five Nations) extending from north to south and thus dividing the Algonkin tribes.

2. The Central Algonkin, west of the Iroquois: Some Ojibway, the Ottawa, Menomini, Sauk and Fox, Potawatomi, Peoria, Illinois, Kickapoo, Miami, Piankashaw, Shawnee, also the Siouan Winnebago.

3. The Eastern Algonkin: The Abnaki group, and the Micmac, not to be distinguished from the northern border group save by their feeble cultivation of maize, the New England tribes, and the Delawares.

While the Iroquoian tribes seem to have been predominant, their material culture suggests a southern origin, thus disqualifying them for places in the type group. The Eastern tribes are not well known, many of them being extinct, but they also seem to have been strongly influenced by the Iroquois and by southern culture. We must therefore turn to the Central group for the type. Even here the data are far from adequate, for the Peoria, Illinois, Miami, and Piankashaw have almost faded away. Little is known of the Kickapoo and Ottawa, and no serious studies of the Shawnee are available. The latter, however, seem to belong with the transitional tribes of the eastern group, if not actually to the Southeastern area. Our discussions therefore must be based on the Ojibway, Menomini, Sauk and Fox, and Winnebago.

Maize, squashes, and beans were cultivated (though weakly by the Ojibway), wild rice where available was a great staple, maple sugar was manufactured; deer, bear, and even buffalo were hunted, also wild fowl; fishing was fairly developed, especially sturgeon fishing on the lakes; pottery was weakly developed but formerly used for cooking vessels; vessels of wood and bark were common; some splint basketry; two types of shelter prevailed, a dome-shaped bark or mat-covered lodge for winter, a rectangular bark house for summer, though the Ojibway tended to use the conical type of the northern border group instead of the latter; canoes of bark and dug-out were used where possible; the toboggan was occasionally used, snowshoes were common; dog traction rare; weaving of bark fiber downward with fingers; soft bags; pack lines; and fish nets; clothing of skins, soft-soled moccasins with drooping flaps, leggings, breech-cloth, and sleeved shirts for men, for women a skirt and jacket, though a one-piece dress was known; skin robes, some woven of rabbitskin; no armor, bows of plain wood, no lances, both the ball-ended and gun-shaped wooden club; in trade days the tomahawk; deer were often driven into the water and killed from canoes (the use of the jack-light should be noted); fish taken with hooks, spears, and nets, small game trapped and snared; work in skins confined to clothing; bags usually woven and other receptacles made of birchbark; mats of reed and cedar bark common; work in wood, stone, and bone weakly developed; probably considerable use of copper in prehistoric times; feather-work rare.

When we come to the Eastern group we find agriculture more intensive (except in the extreme north) and pottery more highly developed. Woven feather cloaks seem to have been common, a southern trait. Work in stone also seems a little more complex; a special development of steatite work. More use was made of edible roots.

The Iroquoian tribes were even more intensive agriculturists and potters, they made some use of the blowgun, developed corn-husk weaving, carved elaborate masks from wood, lived in rectangular long houses of peculiar pattern, built fortifications, and were superior in bone work.[1]

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[1] Consult: Hoffman; Jenks; Parker, (*a*); Chamberlain; Carr; Turner; Skinner, (*a*), (*b*); Harrington; Willoughby.

Southeastern Area. The Southeastern area is conveniently divided by the Mississippi river, the typical culture occurring in the east. As we have noted, the Powhatan group and perhaps the Shawnee are quite intermediate. These eliminated we have the Muskogean and Iroquoian tribes (Cherokee and Tuscarora) as the chief groups, also the Yuchi, Eastern Siouan, Tunican, and Quapaw. The Chitimacha and Atakapa differ chiefly in the greater use of aquatic foods. The Caddoan tribes had a different type of shelter and were otherwise slightly deflected toward the Plains culture. We have little data for the Tonkawa, Karankawa, and Carrizo, but they seem not to have been agriculturists and some of them seem to have lived in tipis like the Lipan, being almost true buffalo Indians. These thus stand as intermediate and may belong with the Plains or the Southwest area. The Biloxi of the east, the extinct Timuqua, and the Florida Seminole are also variants from the type. They were far less dependent upon agriculture and made considerable use of aquatic food. The Timuqua lived in circular houses and, as did the Seminole, made use of bread made of coonti roots (*Zamia primila*), the method of preparing suggesting West Indian influence. The eating of human flesh is also set down as a trait of several Gulf Coast tribes. Our typical culture then may be found at its best among the Muskhogean, Yuchi, and Cherokee.

The following are the most distinctive traits: great use of vegetable food and intensive agriculture; raised maize, cane (a kind of millet), pumpkins, watermelons, tobacco, and after contact with Europeans quickly took up peaches, figs, etc.; large use of wild vegetables also; dogs eaten, the only domestic animal, but chickens, hogs, horses, and even cattle were adopted quickly; deer, bear, and bison in the west were the large game, for deer the stalking and surround methods were used; turkeys and small game were hunted and fish taken when convenient (fish poisons were in use); of manufactured foods bears' oil, hickory-nut oil, persimmon bread, and hominy are noteworthy, to which we may add the famous "black drink"; houses were generally rectangular with curved roofs, covered with thatch or bark, also often provided with plaster walls reinforced with wicker work; towns were well fortified with palisades, dug-out canoes; costume was moderate, chiefly of deerskins, robes of bison, etc., shirt-like garments for men, skirts and toga-like upper garments for women, boot-like moccasins for winter; some woven fabrics of bark fiber, and fine netted feather cloaks, some buffalo-hair weaving in the west; weaving downward with the fingers; fine mats of cane and some corn-husk work; baskets of cane and splints, the double or netted basket and the basket meal sieve are special forms; knives of cane, darts of cane and bone; blowguns in general use; good potters, coil process, paddle decorations; skin dressing by slightly different method from elsewhere (macerated in mortars) and straight scrapers of hafted stone; work in stone of a high order but no true sculpture; little metal work.[1]

Southwestern Area. In the Southwestern area we have a small portion of the United States (New Mexico and Arizona) and an indefinite portion of Mexico. For convenience, we shall ignore all tribes south of the international boundary. Within these limits we have what appear to be two types of culture: the Pueblos and the nomadic tribes, but from our point of view (material culture) this seems not wholly justifiable since the differences are chiefly those of architecture and not unlike those already noted in the Eastern Woodland area. On account of its highly developed state and its prehistoric antecedents, the Pueblo culture appears as the type. The cultures of the different villages are far from uniform, but ignoring minor variations fall into three geographical groups: the Hopi (Walpi, Sichumovi, Hano [Tewa], Shipaulovi, Mishongnovi, Shunopovi, and Oraibi); Zuñi (Zuñi proper, Pescado, Nutria, and Ojo Caliente); and the Rio Grande (Taos, Picuris, San Juan, Santa Clara, San Ildefonso, Tesuque, Pojoaque, Nambe, Jemez, Pecos, Sandia, Isleta, all of Tanoan stock; San Felipe, Cochiti, Santo Domingo, Santa Ana, Sia, Laguna, and Acoma, Keresan stock). The culture of the whole may be characterized first by certain traits not yet found in our survey of the continent; viz., the main dependence upon maize and other cultivated foods (men did the cultivating and weaving of cloth instead of women as above);

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[1] Consult: Swanton; Speck; Jones; Adair; Mooney, (*b*); MacCauley.

the use of a grinding stone instead of a mortar; the art of masonry; loom or upward weaving; cultivated cotton as textile material; pottery decorated in color; a unique type of building; and the domestication of the turkey. These certainly serve to sharply differentiate this culture.

While the main dependence was placed on vegetable food there was some hunting; the eastern villages hunted buffalo and deer, especially Taos. The most unique hunting weapon is the flat, curved rabbit stick. Drives of rabbits and antelope were practised. The principal wild vegetable food was the piñon nut. Of manufactured foods piki bread is the most unique. In former times the villages often traded for meat with the more nomadic tribes. Taos, Pecos, and a few of the frontier villages used buffalo robes and often dressed in deerskins, but woven robes were usual. Men wore aprons and a robe when needed. In addition to cloth robes, some were woven of rabbitskin and some netted with turkey feathers. Women wore a woven garment reaching from the shoulder to the knees, fastened over right shoulder only. For the feet hard-soled moccasins, those for women having long strips of deerskin wound around the leg. Pottery was highly developed and served other uses than the practical. Basketry was known, but not so highly developed as among the non-Pueblo tribes. The dog was kept but not used in transportation and there were no boats. The mechanical arts were not highly developed; their stone work and work in wood while of an advanced type does not excel that of some other areas; some work in turquoise but nothing in metal.

The Pima once lived in adobe houses but not of the Pueblo type, they developed irrigation but also made extensive use of wild plants (mesquite, saguaro, etc.). They raised cotton and wove cloth, were indifferent potters, but experts in basketry. The kindred Papago were similar, though less advanced. The Mohave, Yuma, Cocopa, Maricopa, and Yavapai used a square, flat-roofed house of wood, did not practise irrigation, were not good basket makers (excepting the Yavapai), but otherwise similar to the Pima. The Walapai and Havasupai were somewhat more nomadic.

The preceding appear to be transitional to the Pueblo type, but when we come to the Athapascan-speaking tribes of the eastern side of the area we find some intermediate cultures. Thus, the Jicarilla and Mescalero used the Plains tipi, they raised but little, gathered wild vegetable foods and hunted buffalo and other animals, no weaving but costumes of skin in the Plains type, made a little pottery, good coil baskets, used glass-bead technique of the Plains. The Southern Ute were also in this class. The western Apache differed little from these, but rarely used tipis and gave a little more attention to agriculture. All used shields of buffalo hide and roasted certain roots in holes. In general while the Apache have certain undoubted Pueblo traits they also remind one of the Plains, the Plateaus, and, in a lean-to like shelter, of the Mackenzie area.[1]

The Navaho seem to have taken on their most striking traits under European influence, but their shelter is again the up-ended stick type of the north,[2] while their costume, pottery, and feeble attempts at basketry and formerly at agriculture suggest Pueblo influence.

Thus in the widely diffused traits of agriculture, metate, pottery, and to a less degree the weaving of cloth with loom and spindle, former use of sandals, we have common cultural bonds between all the tribes of the Southwest, uniting them in one culture area. In all these the Pueblos lead. The non-Pueblo tribes skirting the Plains and Plateaus occupy an intermediate position, as doubtless do the tribes to the southwest, from which it appears that after all we have but one distinct type of material culture for this area.[3]

WIDELY DISTRIBUTED TRAITS

Before closing this descriptive survey of material culture we may call attention to certain traits that transcend the bounds of culture areas and cannot, therefore, be so successfully localized. The bow was universal, likewise the simple art of twisting string from vegetable or animal fiber. The firedrill is another, usually the simple hand form. The domestication of the dog was practically universal, but his use for bearing burdens and as a draft animal was limited to a few areas. The smoking of tobacco in a pipe was everywhere except in the extreme north. Curiously enough, the cultivation of tobacco, while not universal, was practised in localities in every area, except the Arctic and possibly the Mackenzie. The soft-tan for deerskin, its treatment by smoke, and the use of the beaming tool are found in some parts of every area. The snowshoe was used wherever the climate or elevation made it necessary. Among other less universal traits are the use of canoes, the true moccasin, basketry, pottery, cooking with stones, weaving downward, maize culture, chipping of stone, the grooved ax and maul, quill and bead technique, sewing with sinew and without a needle, the bowdrill. These traits all tend to show certain differences as we pass from one area to another, yet in their generality they must be considered as inter-area characteristics, the significance of which will be discussed under another head.

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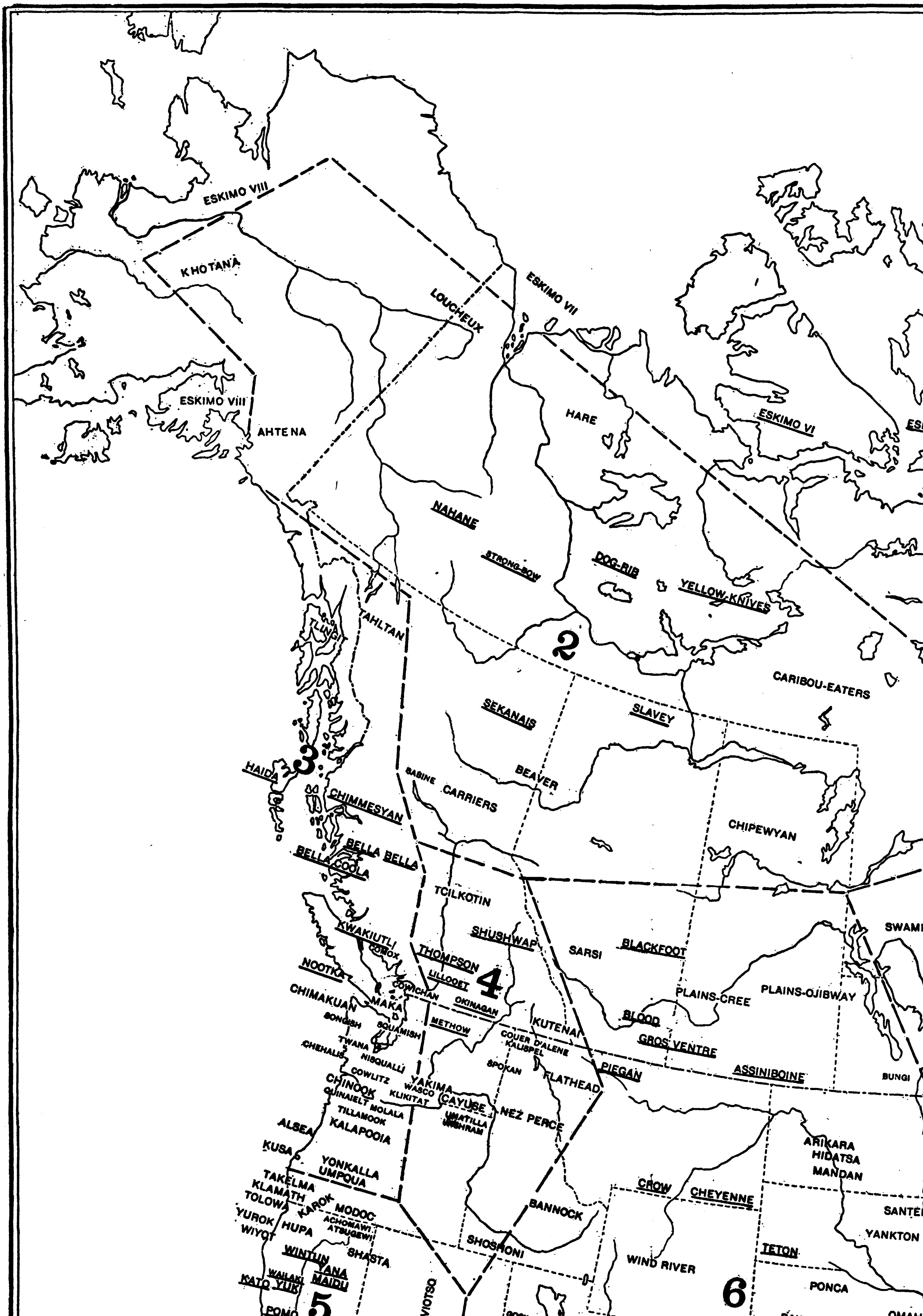
[1] See Goddard, p. 134.

[2] We refer to the older type of hogan and not the modern form. We have seen photographs taken by Dellenbaugh among the Paiute north of the Colorado, showing brush shelters, but apparently supported by three or four interlocking poles. The foundation for the older Navaho hogan was three posts similarly arranged.

[3] Consult: Goddard; Russell; Nordenskiöld; Mindeleff; Cushing, (*a*), (*b*).

CULTURE CENTERS AND THEIR PROBLEMS

If now we consider the brief review of traits we have just made, we note that a culture area as usually defined tends to have well within its borders a group of tribes whose cultures are quite free from the characteristic traits of other areas, or present the type of the area. It is also apparent that these typical tribes are not scattered at random over the area but are contiguous, or definitely localized. We experienced, when the necessary data were available, no great difficulty in selecting the more typical tribes, but we found it often quite impossible to decide to which of two or more areas some of the less typical tribes belonged. It seems then, that while the grouping of all the tribes in inclusive areas is convenient and often useful, the more correct way would be to locate the respective groups of typical tribes as culture centers and classify the other tribes as intermediate or transitional. Thus from this point of view we have nine localities, or material culture centers, between which there are few traits in common: (1) Central Algonkin,


ESKIMO VIII
KHOTANA
LOUCHEUX
ESKIMO VII
ESKIMO VIII
AHTENA
HARE
ESKIMO VI
NAHANE
STRONG-BOW
DOG-RIB
YELLOW-KNIVES
TLINGIT
TAHLTAN
2
CARIBOU-EATERS
SEKANAIS
SLAVEY
HAIDA
3
SABINE
CARRIERS
BEAVER
CHIMMESYAN
CHIPEWYAN
BELLA BELLA
BELLA COOLA
TCILKOTIN
SWAMI
KWAKIUTLI
COMOX
SHUSHWAP
THOMPSON
SARSI
BLACKFOOT
NOOTKA
LILLOOET
4
COWICHAN
CHIMAKUAN
MAKA
OKINAGAN
PLAINS-CREE
PLAINS-OJIBWAY
SONGISH
SQUAMISH
METHOW
KUTENAI
BLOOD
TWANA
COUER D'ALENE
KALISPEL
GROS VENTRE
CHEHALIS
NISQUALLI
SPOKAN
PIEGAN
COWLITZ
FLATHEAD
ASSINIBOINE
BUNGI
YAKIMA
WASCO
KLIKITAT
CHINOOK
QUINAIELT
MOLALA
CAYUSE
UMATILLA
WISHRAM
NEZ PERCE
TILLAMOOK
ALSEA
KALAPOOIA
ARIKARA
HIDATSA
MANDAN
KUSA
YONKALLA
UMPQUA
TAKELMA
KLAMATH
CROW
CHEYENNE
TOLOWA
KAROK
MODOC
SANTE
BANNOCK
YUROK
HUPA
ACHOMAWI
ATSUGEWI
WIYOT
YANKTON
SHOSHONI
SHASTA
TETON
WINTUN
YANA
MAIDU
WAILAKI
KATO
YUKI
WIND RIVER
VIOTSO
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PONCA
POMO
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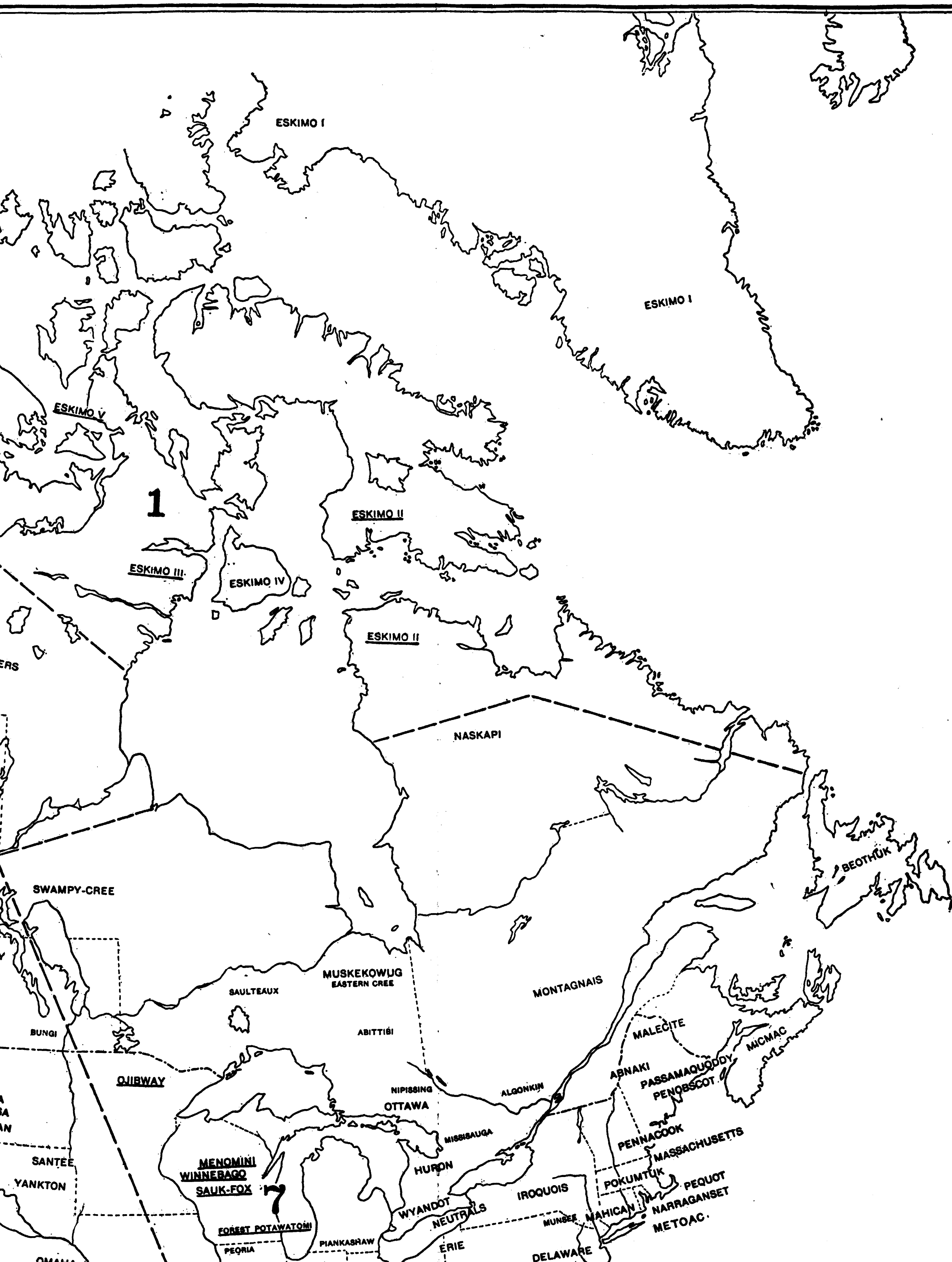
ESKIMO I
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MUSKEKOWUG
EASTERN CREE
SAULTEAUX
MONTAGNAIS
BUNGI
ABITTIBI
MALECITE
MICMAC
ABNAKI
PASSAMAQUODDY
OJIBWAY
NIPISSING
ALGONKIN
PENOBSCOT
OTTAWA
PENNACOOK
MISSISAUGA
MASSACHUSETTS
SANTEE
MENOMINI
WINNEBAGO
HURON
YANKTON
SAUK-FOX
7
IROQUOIS
POKUMTUK
PEQUOT
WYANDOT
NEUTRALS
MUNSEE
MAHICAN
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METOAC
FOREST POTAWATOMI
PIANKASHAW
PEORIA
ERIE
DELAWARE
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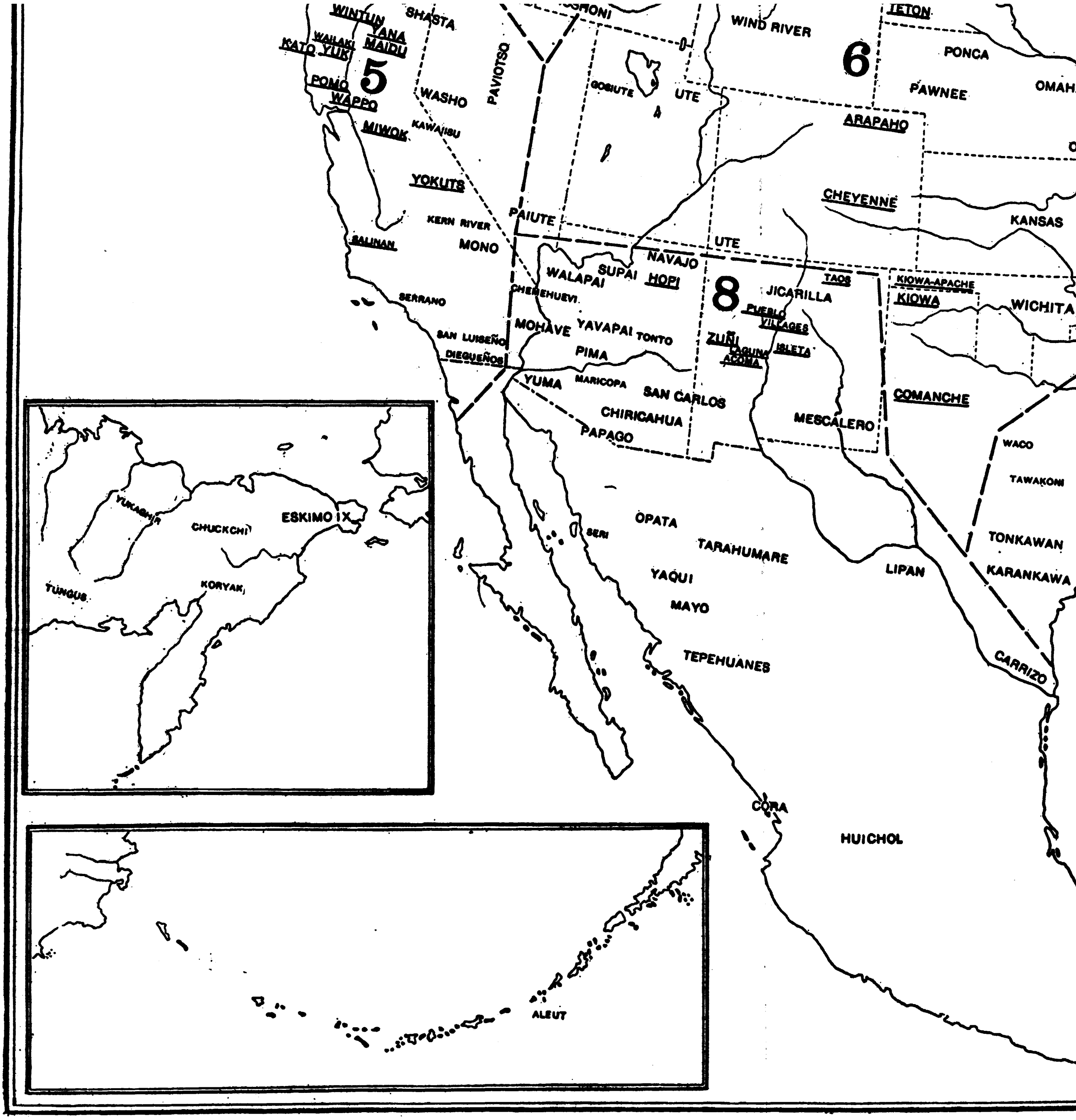
PL. XXXIII



MATERIAL CULTURE

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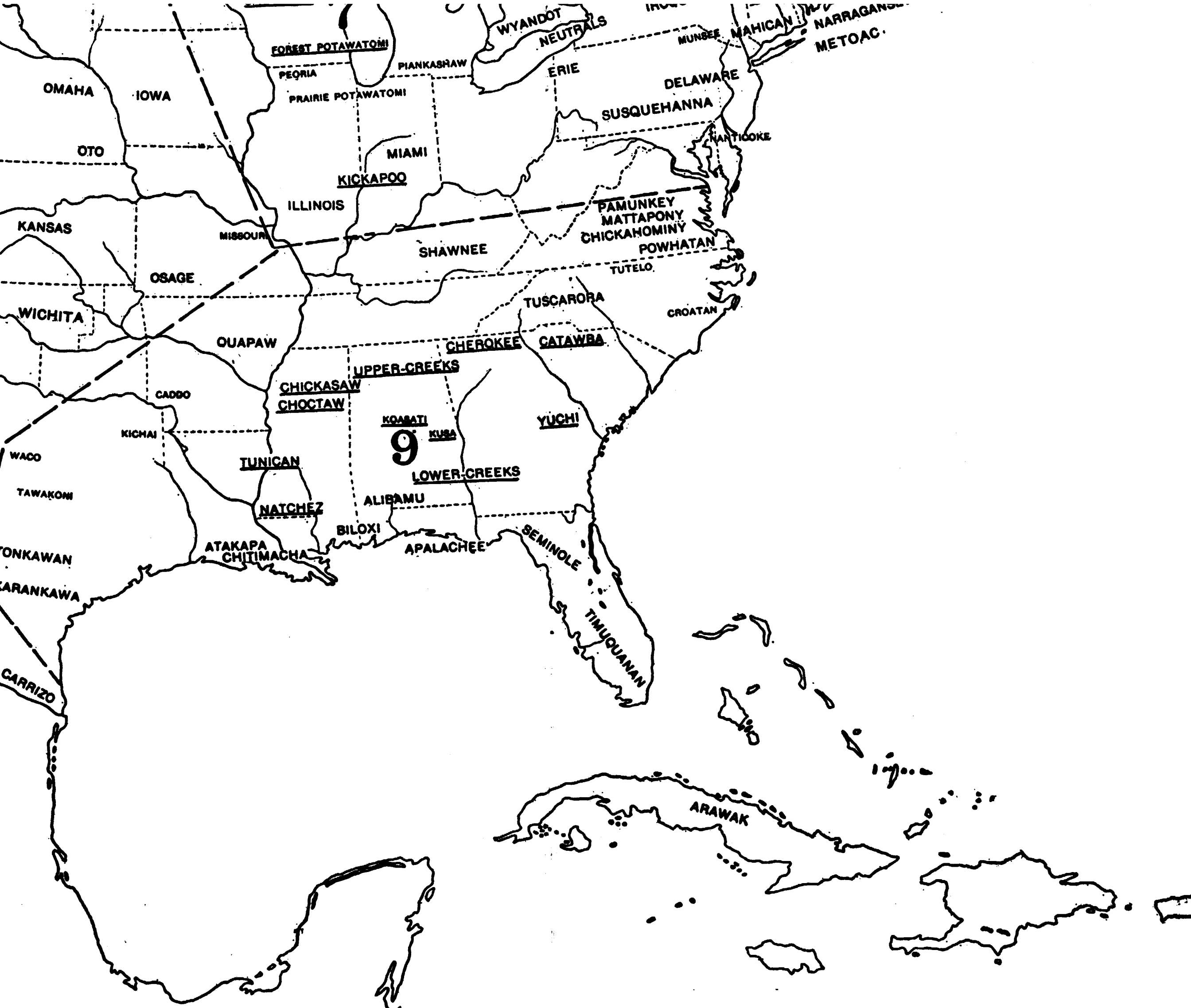

ULTURE CENTERS IN NORTH AMERICA

(See page 467)

(2) Southeastern, (3) Pueblo, (4) Plains, (5) Plateau, (6) California, (7) North Pacific, (8) Mackenzie, and (9) Eskimo. The remaining tribes then fall naturally into intermediate groups: for example, as intermediate to the Central Algonkin and Plains cultures are the Plains-Ojibway, Plains-Cree, Santee, Iowa, and perhaps the Arikara, Mandan, Hidatsa, Peoria, Ponca, Omaha, Pawnee, Oto, Kansas, Missouri, Osage, and Illinois; intermediate to the Plains and the Southeast, the Wichita, the Caddo tribes, the Tonkawa, and Karankawa. In this way we are also able to handle more difficult cases, as the Southern Ute and Jicarilla Apache who stand intermediate to the Plains, Pueblo, and Plateau cultures. On more general grounds a classification by culture to be serviceable must avoid the necessity for too great exactness. The division of a whole continent between a number of areas demands a kind of exactness that is irrelevant to the problems involved. In this respect the method of localizing centers is quite superior, for they can be located without difficulty by the habitats of the few tribes manifesting the separate cultures in their most typical forms.[1] It is then of no great moment if one is omitted, for by the observed rule of geographical continuity it will be found in contact with the type group and hence relatively one of the least intermediate tribes. However, our purpose is not to establish a method of classification but to discuss certain problems arising from the foregoing observations of trait distribution.

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[1] The most typical tribes at each center are designated on the map accompanying this article by underlining. The material culture centers are numbered as follows: 1, The Arctic Area; 2, The Mackenzie Area; 3, The North Pacific Area; 4, The Plateau Area; 5, The California Area; 6, The Plains Area; 7, The Eastern Woodland Area; 8, The Southwestern Area; 9, The Southeastern Area. As stated above the designation by centers is far less arbitrary than the division of the continent into inclusive areas; yet practical considerations make such a demarkation desirable. Accordingly, we have tentatively drawn lines grouping the tribes by their nearest centers. The ideal is to draw the lines through the points of cultural balance, or at the place where the characteristic material traits of one center equal in number and weight those of other centers. Lack of full data and well developed methods for the evaluation of traits makes it impossible to place these lines with geographical precision; hence they must be taken as approximate. This is particularly true of points where three material areas meet, as in Nevada, Texas, and Alaska. Yet, notwithstanding these uncertainties, it is quite improbable that the error of position at any point will exceed that of a single tribal unit. This map was first published in hall labels for the American Museum of Natural History.

Let us, therefore, return to the observed peculiarity of geographical continuity among the habitats of the tribes making up the centers. The fact is plain and has scarcely escaped the notice of a single serious student. Yet, while many have called attention to the inter-gradations of culture, few, for example, have considered the significance of the rarity of abrupt breaks in its continuity in respect to the question of stability *vs.* migration of political units. And again, the significance of this observed continuity relative to the problem of independent invention *vs.* diffusion of traits seems to have almost escaped notice.

One of the first problems to confront us is that of the permanency of these material culture centers. In the first place their very continuity is a strong presumption that their points of origin are to be found near their historic bounds. For instance, we note that the tribes in a culture center have only cultural unity, for they are scarcely ever united politically or speak mutually intelligible languages. It is curious how such uniformity of material culture may be found between neighboring tribes who when on the warpath kill each other at sight: it would seem that such hostility is more of a game than real war. But to return to our problem, such lack of unity makes it difficult to see how in case of invasion from without a simple reaction to migration factors could move the whole group of disparate tribes as a body; it seems much more reasonable that their continuity would be broken. Upon these points we have some check data. For example, in California, the Plains, and Pueblo centers we have great material uniformity with notorious linguistic and political diversity. Then we have the case of the Cheyenne who seem to have been forced into the Plains center where they readily passed from an intermediate state to a typical one.[1] Likewise, the Shoshonean Hopi in the Pueblo center, the Athapascan Kàto in California, and the Chilcotin in the Plateau area seem each to have been caught up by these several cultural swirls and reduced to the type. These examples, however, only suggest the tendency for the various centers to preserve their continuity. On the other hand, definite examples of tribes being forced outward into intermediate positions do not readily come to hand. The Iroquois present a probable case. The evidence seems to warrant the assumption that they are of southern origin and erupted into the Eastern Woodland area, virtually cleaving the continuity of the Algonkin tribes.[1] Just what happened to their material culture can not be stated for want of careful studies. The use of the dome-shaped Algonkin wigwam on both sides of the Iroquois hiatus; and the probable Iroquois adoption of the art of maple-sugar making on the one hand, with the failure of the Iroquois to impart correspondingly characteristic traits to the flanking Algonkin on the other, is consistent with our assumption, but little weight should be given it until more carefully investigated. Yet, in any event, the Iroquois of historic times were not typically southeastern in culture and are at least suggestive negative evidence in support of our assumption. Granting such a disruption of the older Algonkin center, the somewhat untypical culture of the Central Algonkin is intelligible. In his studies of the Plateau center Boas seems to justify the assumption of a Salish migration to the coast; but if such did occur, the typical culture broke down and became intermediate, since we find it so in historic times. Thus what evidence we have seems to indicate that by separating a tribe from a center its material culture is made intermediate and by joining a tribe to a center its culture is made typical. Hence, unless we find data to support the wholesale movement of a material culture center, we must assume stability of habitat during its historic life. We need not, however, assume stability as to its political, linguistic, and somatic unit constituents; but it is clear that abrupt wholesale displacement of them or anything short of the gradual infiltration of new units would tend to destroy the type. We have been long familiar with the lack of correlation between culture, language, and somatic type, but it is doubtful if we yet comprehend the phenomenon.

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[1] Mooney, (*a*).

In material culture we have one of the two great groups of anthropological problems for whose solution the ethnological and archeological methods are equally serviceable. It is chiefly by the use of the latter method that we approach the problem as to the relative ages of the historic centers and the existence of earlier centers. As yet, the results of archeological studies have not advanced sufficiently to give very satisfactory answers to these questions, but so far as they go they favor the great age of these centers. Thus the work of Smith in the Plateau center indicates considerable age and fails to reveal an equally developed predecessor.[1] Again, in California, Nelson finds very old shell deposits but still nothing radically different from the type culture.[2] In the Southwest we have evidence of long occupancy by the Pueblo type. Smith's yet unpublished work in the Plains center brings to light no predecessors. In the Central Algonkin center, the case is not clear, owing to the uncertainty as to the mound culture in the western part of the Eastern Woodland area, but in the eastern part around the lower Hudson and in New Jersey we find a condition similar to that in the Plateau center.[3] Thus, in a general way the geographical stability of our material culture centers is confirmed by archeological evidence.

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[1] Boyle.

Perhaps it should be noted that the tendency of archeological investigation is to show some development in richness and complexity. Thus Smith's results in the Plateau center and Nelson's shell-heap work in California show simpler and somewhat cruder cultures for the lower parts of their deposits, but the persistence of many fundamental forms throughout suggests that the succeeding cultures were built upon the foundation laid down at what seems to have been the period of earliest occupancy. This also seems to be true of shell and other deposits in the vicinity of New York City. Even in the Pueblo center we find a similar condition. So the best interpretation we can give the observed data is that in the formative period of North American material cultures the types now appearing in our centers were localized but less differentiated and that the striking individuality they now possess resulted from a more or less gradual expansion along original lines.

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[1] Smith, (*a*).

[2] Nelson, N. C., (*a*), (*b*).

[3] Skinner, (*c*). As we have suggested, it is possible that the Iroquoian expansion struck the old and original center of the Algonkin tribes. Mr Parker finds sites in New York where Iroquoian remains overlie others of Algonkin type, yet many Iroquoian sites bear every indication of respectable age. (Parker, (*b*), p. 88.) Hence the present Algonkin center can not be a recent development. Professor Dixon's recent paper (pp. 549–566) calls attention to the assumed superposition of cultures on the Atlantic side of the continent; but in no case has a careful analysis of the area been made. Yet we are here concerned only with the archeology of the territory occupied by the few tribes forming our material centers, and the complications cited by Dixon are chiefly in the territories of intermediate tribes and on the extreme margins of the continent. Our discussion has not sought to make the centers the first American cultures, but only to show that they are relatively old. We may add that one of the best ways to approach the correlation of eastern ethnology and archeology would be to investigate the territory at a center and use the types thus obtained as the point of departure.

If, as we now have reason to believe, the material cultures of these centers possess great vitality, are often able to completely dominate intrusive cultural units and so keep to their habitats as it were, it may be well to inquire if there are not objective causes for this persistence of localization.

It is natural to suspect the subtle influence of the environment, since the fauna and flora of the locality are certain to leave their stamps upon material culture. One of the most distinctive characteristics is the tendency to specialize in some one or two foods. In California it is the acorn; Plateau, salmon and roots; on the North Pacific coast, sea food; Mackenzie, caribou; Plains, the buffalo; Southwest, maize; Southeast, maize and roots; the Eastern Woodlands, wild rice and maple sugar. We here refer to the prepared and stored foods, the staples; though in quantity they may at times be minor foods, they play a very necessary rôle. All the centers have more or less elaborate processes of preparation involving technical knowledge: for example, the making of acorn flour and bread, the roasting of camas, etc. These processes tend to spread throughout the area of supply. Thus the acorn industry extends well up into Oregon far beyond the California center; the roasting of camas to the mouth of the Columbia and also to the Blackfoot of the Plains, etc. Again we note certain specializations of manufacture; California, baskets; North Pacific coast, boxes and plank work; the Plains, rawhide work (parfleche, bags, etc.); Mackenzie, birch-bark (canoes, vessels, etc.); Plateau, sagebrush weaving; Southwest, textiles and pottery; Southeast, cane and fiber weaving; the Eastern Woodlands, knot bowls and bass fiber weaving. Types of shelter present similar distributions and so do many other traits. All of these traits are seen to reach out far beyond the borders of the respective type centers. While foods are quite dependent upon the faunal and floral distributions, some other traits are not (pottery, for example). In any case the people have but chosen a few of the possibilities and specialized in them, leaving many other resources untouched. Apparently we have here the fixity of habit or custom, a group having once worked out a process, like the use of acorns, its practice tends to find its way over the contiguous acorn area and, where established, to persist. The successful adjustment to a given locality of one tribe is utilized by neighbors to the extension of the type and to the inhibition of new inventions, or adjustments. Therefore, the origin of a material center seems due to ethnic factors more than to geographical ones. The location of these centers is then largely a matter of ethnic accident, but once located and the adjustments made, the stability of the environment doubtless tends to hold each particular type of material culture to its initial locality, even in the face of many changes in blood and language. Perhaps here at last we have laid bare the environmental factor in culture and chanced upon the real significance of the long observed lack of correlation between culture, language, and anatomy.

Before we leave this subject it may not be amiss to examine the cultural relations of the few tribes constituting one of our centers. It is an axiom that absolute cultural identity is impossible, for this is but another way of asserting variation. We may expect, therefore, certain tribal individualities. Our conception of a type unit is one in whose culture there are no appreciable traits characteristic of other centers. When we select a group of tribes as the constituents of a center, we do not assume absolute identity in culture; for the facts are plain, that the gradation observed among the intermediate tribes extends into the typical group. It must follow, therefore, that some one tribe is the most typical, or manifests the type culture in its purest form. As an experiment, take the Plains group to which the Blackfoot, Gros Ventre, Assiniboine, Crow, Teton-Oglala, Arapaho, Cheyenne, Kiowa, and Comanche clearly belong. Then by cancellation proceed to eliminate the variants, or those tribes manifesting traits characteristic of other centers. If we take shelter, the brush lodge tendencies of the Comanche eliminate them; packing by dogs without the travois, the Crow, Kiowa, and Comanche; occasional water transportation in bark canoes, the Assiniboine (historical data); the use of fur caps, certain northern forms of bags, the Blackfoot and Gros Ventre; on historical data as to costume, the Cheyenne; absence of special forms of shirts for men, the Kiowa, Cheyenne, Arapaho, and Comanche; a one-eared tipi, the Kiowa and Comanche; and some use of hooded-coats for men, the Blackfoot, Gros Ventre, and the Crow. We have now eliminated all save the Teton-Oglala. The Arapaho stand next, and then the Crow. If we line these up according to certain parfleche peculiarities and certain types of bags frequent among westward intermediate tribes, we discount the Arapaho. If it were not for early historical data on the Cheyenne, they would lead the Arapaho. So far as the data go the Cheyenne since their migration were in most intimate contact with the Teton and the Arapaho. Thus our finding is consistent and also quite suggestive. We have good grounds for localizing the center of Plains culture between the Teton, Arapaho, Cheyenne, and Crow, with the odds in favor of the first.[1] When we turn to a map we find again geographical continuity, these four tribes being neighbors. Further, they are in the very heart of the area for the typical tribes. Similar treatment of other central groups gives analogous results, though not always so nicely balanced geographically. It seems, then, that when we come to deal with the distributions of associated material traits, we find certain points where specialization and individuality are greatest.

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[1] Considerations of space make it necessary to omit a discussion of the relative significance of these traits and a justification of the procedure. See Galton's remarks (p. 270) on weighting cultural characters. The reducing of a center to a single tribe is presented only as the logical finale of our classification, the political identity of the tribe in question is not now important. It is clear that when we commit ourselves to a classification based upon the similarities of traits, and accept the principle of inter-gradation, we must expect to designate some one or two tribes as the most typical.

If we should proceed by the above method of determination, we should ultimately specify nine political or social units whose material cultures could be taken as the individualized American types. Thus these studies of distribution lead us into new and perplexing problems. We seem to be dealing with ethnic forces, the lines of whose radiation are approximately determinable, but whose directions of movement are by no means obvious. What are the points of origin? Are these nine hypothetical tribes the originators of these cultures, or even the perpetuators from whom all influences start? Or, are they but the resultants of forces moving in the opposite direction, and then from whence? One line of inquiry suggests itself. Since these centers may well be but the type units of a larger group, we may approach this problem by seeking for traits common to the centers and for evidence of their reaction upon each other, or in other words consider the distribution of the few very general traits previously enumerated.

The cultivation of maize was spread over a considerable part of the continent. It was universal in the Southwest; among all the tribes intermediate to the Plains, Central Algonkin, and Southeastern centers, except those of the extreme north and possibly the Tonkawa; all of the Southeastern area except a few on the Gulf coast, and all of the Eastern Woodland area except the extreme north. Scarcely any of the intermediate tribes in the California and the Plateau areas made even the feeblest of efforts to cultivate it. The most striking fact is that if you plot this distribution over an ethnographical map you have almost absolute continuity. This continuity also extends far down into Mexico and perhaps is continuous with the maize area of South America. In this case, we have no reason to doubt the direction of diffusion, for botanical evidence makes it certain that the art of maize cultivation arose south of the Rio Grande.[1]

Another interesting trait is pottery. All the tribes cultivating maize made some form of it, but it went somewhat farther into the California and Plateau areas. Yet from southern California northward to the limits of the North Pacific area, including the greater part of the Mackenzie area, we have no certain traces of pottery in either historic or prehistoric times. In Alaska, however, it recurs among the Eskimo chiefly and extends eastward to Cape Parry at least. Some historical data make it probable that pottery was once made by all the type tribes of the Plains center and possibly by the Northern Shoshonean tribes. So disregarding for the present the pottery of the Arctic coast we have a distribution slightly more extensive but still coincident with the maize area. Internal continuity we have and also to the south far into South America. Roughly considered, this pottery is of two kinds, painted and incised (and stamped). The former prevails over the Southwest and eastward to the lower Mississippi, the remainder is incised or stamped and is confined chiefly to the Atlantic coast and Great Lake regions.[1] Here again we find continuity southward for painted ware. Unfortunately, we cannot call in extraneous evidence to prove the direction of pottery diffusion and it will scarcely do to trust to an analogy with maize. It has been reported that incised ware also occurs on the South American Atlantic coast.[2] That this is due to an older continuity between the two continents at large is unsupported by archeological evidence, but similar marked pottery from the West Indies suggests a regional and insular continuity.[3]

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[1] Harshberger.

The southern origin of the blowgun is quite probable. We find it still in use among the Seminole of Florida and formerly known to most of the Southeastern tribes; it also occurs among the Iroquois. Perhaps in the same class may be placed the methods of preparing the coonti root, for the plant is found in the West Indies.

Weaving in its crudest forms is quite universal, but certain specialized forms can be definitely distributed. The art requires two unrelated processes, spinning and weaving. The fundamental art of twisting fibers into string is universal, but the Déné, Central Algonkin, Iroquois, Eastern Algonkin, and all of the tribes of the Southeastern area made thread of bark fibers. These were shredded and twisted without spindles, so far as we know, the usual method being to roll the strands on the thigh or ankle.[1] The resulting thread was woven into pack straps, but especially into bags in the north. In the south, clothing seems to have been so made, and even footwear. The method of weaving was everywhere the same, the warp strands being suspended loosely from a rod or cord and the fabrication proceeding downward, the woof being inserted by the fingers. This type of weaving occurs in the Plateau and North Pacific Coast areas. In this region, however, the weaving is of two types. The intermediate North Pacific area produced blankets of goat and dog wool. While so far as we know the weaving was downward as before, a spindle has been used in historic times. In the Plateau area sagebrush bark fiber was coarsely twisted and joined by occasional woof strands. Among the intermediate Salish, and the Kwakiutl, this method was used with cedar bark. Among certain intermediate Alaskan tribes the method appears, but for bags only and not for clothing. In the Plateau area we have some evidence that the Shoshonean tribes used clothing of sagebrush, which we presume was made by the same method. The Shahaptian, however, seem not to have made blankets or clothing of fiber.

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[1] Holmes, (*b*).

[2] Hrdlička, p. 151.

[3] De Booy, p. 425.

In the Southwest we have a high development of weaving with a true loom, or upward weaving, and the use of spindles.

Thus so far as our data go we have the spindle in two regions, the Southwest and the greater part of the Plateau and North Pacific areas. If its use could be established for the Shoshonean tribes of Nevada and Idaho we should have a continuous distribution from north to south, which taken in connection with the wide use of the spindle south of the Rio Grande would again indicate a southern origin. Unfortunately, we lack data on this point. That the spindle was recently introduced to the Salish area is suggested but not proven, by the absence of bone and stone spindle whorls in archeological collections.[2] In the Southeastern area there seems to have been some use of an improvised spindle, a stick bearing a ball of clay, but anything like a true spindle whorl is rare in archeological collections.[1] In this area, however, we must allow for contact with the Southwest.

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[1] Holmes, (*b*).

[2] Smith, (*a*).

As to the loom, we have also the use of a weaving frame in parts of the Mackenzie and Plateau areas.[2] Rabbitskin robes were made by wrapping the warp around a rectangular frame and some of the Salish made use of a loom frame with a continuous warp of spun goat or dog hair, the two processes doubtless connected historically. On the other hand, this use of a frame without a batten or held seems to have a restricted distribution and to be discontinuous with the Southwest, though here again we lack full data as to weaving technique, for the rabbitskin blanket extends well down through the Plateaus into the Southwest. We have previously suggested that the frame for the rabbitskin blanket may have been derived from the skin-dressing frame, in which case its independent origin would be probable. The direction of weaving for rabbitskin blankets among the Cree is downward and sometimes the warp is hung from a stick or cord,[3] and not wrapped around the frame. This brings us back to what seems a fundamental distinction between the weaving of the Southwest and the other areas. If we extend our data so as to include flexible baskets, we have practically a continuous distribution of downward weaving; or where the beginning is at the top of a suspended warp base, from the Aleutians, through the Tlingit, into the Déné, the northern Algonkin and thence to the Gulf and the Atlantic seaboard. Thus, it is clear that we have a widely distributed method of weaving developed on different lines from that of Mexico and the Andean region. The continuous wrapped warp on the simple frames of some Salish and Déné is also suggestive of the Southwest and in contrast to the Chilkat and Algonkin modes.

The art of basketry has a distribution similar to that of weaving. In one form or another it is found in every area from the Southwest to the Eskimo. The prevailing techniques are twine, coil, and splint. The art was rather weak in the Plains, its almost entire absence from the Plains center having been noted. In the main, basketry is found intensified in two regions, the western mountainous belt and the eastern Atlantic belt. Though coil baskets were occasionally made by the Central Eskimo, the Ojibway and possibly other Eastern and Southeastern Indians (Mason), they are characteristic of the western area where they have a continuous distribution from Alaska[1] to the Rio Grande. One peculiarity of this distribution is that it is inland, the Tlingit and practically all the tribes of the coast down to the Californian center using the twine method. On the other hand, the twine technique is practised in the coil area, except perhaps in the extreme north. As we have previously noted, there is a continuous distribution for the flexible basket and bag woven from suspended warp, from the Aleutian islands southeastward to the Atlantic, which gives us another interesting problem. In contrast to this technique we have the stiff warp twine baskets of the Salish, Shoshone, California, and the Southwest tribes, again a continuous distribution suggesting a common origin. Likewise, the coil technique of this western region is distinct, because the few specimens known from the Ojibway and the Central Eskimo are sewed with a wide open stitch in a manner that indicates a different process concept.

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[1] Holmes, (*b*).

[2] See: Morice, (*a*); Skinner, (*a*); Teit, (*a*); Boas, (*a*).

[3] Skinner, (*a*).

In the east basketry specialized in cane and splints: The very strong development of cane basketry in the Southeast, taken with the previously noted cultural intrusions into the Eastern Woodland area, makes it probable that the wood splint technique is historically connected with that of cane. Cane basketry is also highly developed in eastern South America, to which the West Indies give us insular continuity.

The limits of this paper forbid the further discussion of textile distribution, but it is now clear that it presents some of the most interesting problems in material culture. The study of forms, methods of ornamentation, etc., readily differentiates local variations of greater or less distribution, the comprehensive comparison of which would go far toward solving the historical relations of our centers.

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[1] Coil baskets also extend into Siberia. The distribution for the whole North American continent has been worked out by O. T. Mason.

Coincident with the greater part of the western basketry region are the limits of stone boiling. Naturally, its distribution follows closely the outskirts of the pottery-using region. All the pottery-making tribes are pot boilers as are also the Eskimo. The extreme northern Algonkins and part of the Déné used stones but often hung bark vessels over beds of coals, a pot-boiling method. The Plains tribes were on the border line between the two great areas and varied accordingly.

Clothing is another feature of interest. The Eskimo were heavily clothed, the Déné but slightly less so. The Interior Salish, the most Eastern Shoshone, and even some Apache of the Southwest covered practically the whole body with clothing, usually of skins. In contrast to this the Indians of California and the whole Pacific Coast belt wore little clothing, except in the far north. In the Plains, the tribes of the center resembled the Shoshone while the Eastern intermediate tribes were inclined to nudity. East of the Mississippi, except in the far north, the tendency was likewise to nudity. Even in the Pueblo area men seldom wore shirts or leggings. Again we have one of those curious continuities in distribution, the real clothing of the body stretching across the Eskimo, Déné, and extreme northern Algonkin territories, dipping down through the Plateau and Plains areas almost into the Southwest where climatic conditions certainly made it inessential. This bears the earmarks of a northern intrusion and sets up at new angles the problem of the Shoshonean tribes and the beginnings of Plains culture.

In a similar manner dog transportation dips into the southern Plains. In winter dogs are used with sleds by the Eskimo and some adjacent tribes (Hearne), but in summer the Eskimo west of Hudson bay use them for packing and the dragging of tent poles, precisely as described by Coronado for the extreme southern Plains. Between these two points we have a continuous distribution of packing or dragging bundles by dogs. The wide distribution in the north and its apex-like form in the south suggest a northern origin.

If space permitted we could make a special study of specific articles of dress, the basket hat in the west, the moccasin, the rabbitskin coat, the turkey-feather mantle, etc., which, as with the textile arts, would develop many important problems. Many other traits could be studied in this way. We may note the problems of defensive armor in the Northwest,[1] the seeming Asiatic origin of the sinew-backed bow[2] and the bowdrill, the recent introduction of the Asiatic pipe among the Eskimo, etc.

Among other points this hasty sketch of widely distributed traits has developed at least one general line of cleavage. If we draw a line southward through the extended Plains center, along the eastern limits of the Rocky mountains, we divide the continent into two parts each of which in respect to the traits just discussed has some claim to cultural distinction. On either side of this line within the United States the cultures stand out clearly. In the main, it is along this line that textiles are differentiated, likewise in part maize and pottery. Clothing also changes here. Certain traits in the east seem to have pushed up from South America across the West Indies, others appear north of the Rio Grande as the outposts of the higher cultures of the south. Across northern Canada from east to west is the caribou culture with its associated traits. The line of cleavage we have noted in the United States seems to be the extended southern apex of the caribou area. It almost separates the east from the west, and raises a number of problems we have no space to discuss. Thus our consideration of widely distributed material traits has developed at least three general areas, with each of which the respective centers have something in common. The suggestion is that, more often than not, the tendency is for cultural continuity to range north and south on each side of this line, hence we must assume some historical connections between the respective centers. Yet, so far, there appear no indications that all the centers of the west can be classed as the former constituents of a single center; but on the east it seems quite probable that the Algonkin center has developed from an ancient culture intermediate to the caribou and southeastern centers.

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[1] Hough; Laufer.

[2] Mason, (*a*).

In the foregoing discussion of distribution we have seen positive proof of the northern spread of an important trait, maize culture engulfing three contiguous centers, and noted the analogous distribution of several other traits in which the probability of a southern origin is very great (painted pottery, loom weaving, blowguns, and tobacco). Again we have certain probabilities of culture infusion from Asia by way of Alaska, though less definite because in some cases the evidence favors the movement from America to Asia rather than the reverse. In Asia we seem to have similar continental conditions, for the great culture centers lay toward the south and exerted a strong influence upon the north, leaving the two continents in contact where their later cultures were weakest. We could, however, dismiss this peculiar inter-continental relation at once, if it were not for the belief that the Indians came from Asia via Alaska, at a relatively recent period. Each year of anthropological advance has seen the assumption become more and more of a conviction that this peopling of America could not have been much earlier than the dawn of the neolithic period in the Old World.[1] Granting this, we see that our material culture centers lie in the path of invasion and, if of considerable age, may even represent original intrusions from the Old World. As we have noted, archeological evidence seems not only to confirm the long durations of most of these centers but fails to reveal the remains of extinct predecessors.

If cultural groups came from the Old World with a neolithic or a very late paleolithic horizon they could have brought with them the following traits: knowledge of fire (presumably the wooden drill), chipping and polishing stone, the bow, the bone harpoon point, the notched arrowhead, the dog, elemental knowledge of skin dressing. There is no reason why they may not have known the simple art of twisting string, the use of nets and snares, been expert hunters, and in fact have possessed all the fundamental concepts of all the more general mechanical processes. This list, it will be observed, includes a considerable number of the traits common to our centers and may possibly represent the original culture of the immigrants. Yet, until we know a great deal about the earliest archeology of northern Asia, this must remain the merest speculation. On the other hand, certain very widely distributed traits are more likely of American origin and therefore must represent either older traits than those peculiar to the respective centers or more recently diffused ones. It will be noted, however, that such of these common traits as appear truly American are found to be more highly specialized and less fundamental. In short, all the status of the case seems to warrant, is the suggestion that except where a definite Old World similarity is found, most of the widely distributed traits of North America seem to have emanated from centers south of the United States, and not from Alaska, or from the Old World. This general fact has long been one of the traditions of our science, but the determination of the general northern trend of the most distinctively American traits must remain one of our problems and especially the harmonizing of our conclusions with the belief in an Asiatic origin.

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[1] Our complete ignorance of paleolithic Asia is now the chief obstacle to a satisfactory theory for the origin of the American race. For all we now know late paleolithic Europe may have been contemporaneous with early neolithic Asia.

Again we may consider what would happen to our centers, if we subtracted the traits suggesting the south and also those traits that seem to have come into Alaska recently. Suppose we cancel out agriculture, pottery, loom-weaving, and the use of tobacco, not to mention several minor traits. These would at once greatly reduce material differences, making all dependent upon game and wild vegetables and regulating their lives according to the resources of their respective habitats. In this way it is clear that we might reduce our centers to a primitive culture not unlike that of early neolithic Europe, whence it would not be unlikely that the development of some type individualities began after the first dispersion of tribes over the continent. In other words, there are various reasons for believing in the legitimacy of problems relating to the permanency and relatively early origin of centers. Finally, we have found a probable answer to our question as to the former genetic relations of the material centers: viz., that in so far as they are individual they are quite independent and as indicated by the environmental, ethnological, and archeological data, developed their peculiarities approximately within the respective territories of the typical groups of tribes.

We have noted that in the few important archeological studies made for our centers, the earliest forms of culture are less complex and that there is likewise a suggestion of far greater similarity between the respective centers at that time. If then we cancel out the probable intrusive traits, as above, and discount the individualization of our centers, we reach a simpler form of culture in which the common origin of our centers is possible. Also, the general quantitative similarity of these residual traits to late paleolithic or early neolithic culture is apparent.

We may again revert to the probable antiquity of origin. For the Eskimo and Mackenzie area we have no good archeological data, but for the remaining we have at least suggestive data, and the only one for which there appears a reasonable doubt is the Plains center. This doubt arises principally from more or less vague historical indications of recent migrations on the part of the typical tribes; thus the Cheyenne are considered recent arrivals, the Plains-Cree and Plains-Ojibway are clearly migrants, the Sarsi, Arapaho, Gros Ventre, Comanche, and Blackfoot have linguistic affiliations that make their migrations quite probable; the Crow and Teton have very near relatives among the intermediate group, raising doubts as to their original habitats. In short, with the possible exception of the Kiowa, all may be suspected as relatively recent intruders. No such condition holds for the other centers. Again when we look at the great intermediate group just west of the Mississippi river, we see a striking peculiarity in the earth-lodge, which under other circumstances would be taken as the index of a new type of culture. Recalling that one of the chief characteristics of the typical group is horse culture and that this must have arisen since 1492, it becomes probable that this group arose since that date and so suggests that some of the now intermediate tribes formerly constituted a distinct culture center, but now obscured by disintegration. It becomes necessary, therefore, to analyze the material culture of these tribes to see if the elements of an older center can be differentiated. We have previously reviewed the place of the horse among the formative factors in Plains culture, with the result that practically all traits except those absolutely associated with the horse were formed before its introduction to the continent. On the other hand, there was good reason to believe that the stimulus of the horse did solidify and intensify the particular association of traits we now take as the type. When, however, we turn again to the earth-lodge-using tribes we find the familiar maize culture of the Southeast. The very weak development of agriculture among the Central Algonkins suggests this southern influence, but we have also the general use of the shoulder-blade hoe in apparent continuity from the Mandan to the mouth of the Mississippi, not to mention forms of the Green Corn ceremonies. The weaving of buffalo hair was quite a trait in the south, and this also we find in varying degrees among the transitional tribes. The peculiar basketry of the Arikara, Mandan, and Hidatsa in its forms, materials, and especially in its decoration suggests the cane work of the south. Fortified villages were also known on the Missouri, a prominent Southeastern trait.

Central Algonkin material traits are less obvious. We have some possible influence in matting and woven bags, also some crude attempts to make sugar of boxelder and other saps. The more northern tribes gathered some wild rice and used canoes, the birchbark culture of the north making itself felt to some extent. In costume the relation is fairly clear, for we have even today a tendency toward the styles of the Central Algonkin below the Missouri, but a tendency toward the Plains costume north of that point. The method of wearing the hair followed a like distribution; the sides of the head shaved in the south, long braids in the north. These differences again remind us of our finding a Dakota tribe to be the most typical, thus pointing toward the Dakota group as one of the originators of Plains culture.

None of these traits are, however, so significant as the earth-lodge. Its known distribution is the Arikara, Hidatsa, Mandan, Ponca, Omaha, Pawnee, Oto, Missouri, Kansas, and Osage, upon which we have commented at length in another place. Structurally it is almost unique, but nevertheless presents some vague southern resemblances. A type of thatched house formerly used on the lower Mississippi but not fully described seems to have had a framework similar to this. Again, the method of covering with earth is found in the south, but neither of these can have much weight and leave its independent origin as probable. The grass house of the Wichita is clearly related to the southern types.[1] The dome-shaped mat and bark-covered lodge of the Algonkin was used by the Iowa and sometimes by the Osage. The Eastern Dakota made some use of a rectangular cabin apparently like some of the Sauk and Fox. All of these are intrusive types and by their presence tend to isolate the earth-lodge. Yet, the tipi was in general use and we have elsewhere noted the peculiar tendency of these tribes to live in it, at all times when not actually engaged with their fields, even in midwinter. This association between types of shelter and maize culture raises the suspicion that they may have come into the area together and so leaves us some reason to doubt the significance of the earth-lodge. The restricted distribution of the bull-boat, however, rather strengthens its claim to independent origin. We have, nevertheless, gone far enough to prove the later intermediate character of these tribes. When we note their use of the tipi, dog travois, parfleche and other rawhide work, technique of bead and quill work, weak development of textiles, large use of the buffalo, and the buffalo-hide shield, their fundamental Plains characteristics appear. These traits we have reason to believe are older than the introduction of the horse and the intensified development of the typical group. We suspect, then, the existence of an older Plains center which was strongly influenced by the Southeastern and later by the Central Algonkin centers, but nevertheless of a distinct type and probably formed before the introduction of maize culture.

In an article on the horse culture of the Plains we have cited the prehistoric cultures of the tribes nearest Santa Fé, among which we can certainly place the Comanche and Kiowa, as having the basic elements of what later came to be the typical culture.[1] Our hypothesis is, that in these non-agricultural dog-using rovers after buffalo we have the outlying fringe of the older Plains culture, modified by Plateau influence, but still an indication of what prevailed at the earlier Plains center before agriculture and other foreign traits secured a footing. It was thus that the coming of the horse gave a new impetus to the Plains traits surviving among these then intermediate tribes and elevated them to the status of typical tribes. If this interpretation be correct, we have conditions similar to those in the Eastern Woodland area, the disrupting influence here being the subtle influence of intrusive native traits from the southeast and the later northward pressure of horse-using tribes. Horse culture appears here, however, as only a revivified or intensified form of the older Plains culture and so does not break the sequence of the type of this area, which demands considerable antiquity for its date of origin.

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[1] In this connection consult Miss Fletcher's Omaha, p. 75, for the Arikara origin of the Omaha earth-lodge.

If space permitted, a somewhat similar analysis of the Eastern Woodland area could be made and likewise an archeological survey of the Ohio Valley Mound area. We have, however, gone far enough to suggest a number of problems. Needless to say the various conclusions we have offered are in no way final but merely indicate new lines of research. By our characterization of the culture areas, as sanctioned by usage, we were able to determine the approximate geographical centers in which the most highly individualized cultures existed. By viewing the distribution of culture traits from the standpoint of geographical continuity, we were able to draw some conclusion as to the directions of influence for certain traits and also to define their relation to the geographical environment. We found it at least probable that it was the environment that maintained the cultural integrity and continuity of the centers, and also was largely responsible for the lack of correlation between language, culture, and somatic type.

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[1] Wissler, (*d*).

TRAIT ASSOCIATION

In this discussion we have used the term material culture without considering in what manner the traits composing it were related. The most obvious bond between them is their mere pertaining to the same political unit. In case a group of people manifests a trait, such a trait is by virtue of that relation alone an element of their culture. We characterize or determine a type of material culture by enumerating the several traits as stated at the outset; hence, unless we can find some basis for this association other than mere presence in the life of a political unit, these traits have no functional relations to each other.

Material traits are chiefly productive processes and if we take these processes in unit cycles, their relations are not difficult to comprehend. Thus, in maize culture we have the related processes of planting, tending, gathering, preserving, storing, grinding, cooking, each of which may be quite complex and all of which are dependent one upon the other. If then we note pottery as a trait, we find another cycle of processes dependent upon each other; but between the traits of pottery and maize no such dependence is apparent. We know of no good reason why maize could not be boiled in a basket, box, or bark vessel, and yet we have found the distribution of these two traits almost coincident. This coincidence therefore can scarcely be due to functional relation between the two traits. It may be accidental, but on the other hand, may have an historical explanation in that the people from whom maize culture was derived cooked in pots. The two would thus be objectively associated and might be naïvely regarded as functionally associated, or as belonging to the same unit cycle; but it is clear that one could be taken up without the other. Another interesting example has been noted among some of the tribes intermediate to the Plains center; they lived in tipis at all times, except when engaged with the production of maize, when they occupied permanent houses of a different type. Now, the house has no known functional relation to the production of maize; hence, if the tipi sufficed on one occasion, it could upon the other. Again, it could be a mere accident, but also due to the historical association of such shelters with the cultivation of maize.

Also we may cite the case of skin clothing and dog transportation whose respective distributions approximately coincide. Both seem to come from the far north where they may be observed as two of the several traits forming the Eskimo type of culture. In general, if we take up one trait after the other, in their unit cycles of processes, we find very little support for the assumption of functional relations between the various traits in a material culture; but do find suggestions of associations brought about by historical causes.[1]

Such functional independence of traits suggests the futility of all studies based upon functional assumptions, unless it be that we can show that in the long run the presence of certain traits is coincident with others. While this fundamental principle of the evolutionary school of anthropology has been generally rejected as an unwarranted assumption, it may be well to consider the possibility of mere complexity and high development in one trait being correlated with complexity and high development in others. To a certain extent this principle holds, for we do not expect very complex material developments without considerable complexity in other phases of culture; but when strictly applied to American phenomena it falls short of universality. Thus in California we have high development of basketry with great simplicity in other traits. Likewise, the use of acorns as food is in California associated with simplicity of culture, but the Iroquois[2] used acorn meal in a somewhat similar way, though, of course, they depended far less upon this food than did the Californians. On the other hand, while the Californians have specialized on vegetable foods, this aspect of their culture when considered as a whole is seemingly less complex than the vegetable food development of the Iroquois or the Pueblos. If, however, we analyze these cultures we find that the respective traits are not so much more complex as they are numerous, and that our estimate of complexity is based upon the totality of material culture as a whole and does not apply to the processes themselves. For example, the California acorn process is fully as complex as the Iroquois maple-sugar process.

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[1] In this connection we may cite Tylor's discussion of "adhesions," pp. 245–270.

[2] Parker, (*a*).

Thus, we are brought to the view that the association of traits in material culture has no important intra-functional significance and that we must seek for extraneous causes to account for their observed correlations. We believe that historical explanations for such correlations will be found the most acceptable, for these do not exclude mere accident.

However, environmental causes are sometimes set up in opposition to historical causes. In the discussion of the Mackenzie, or Déné area, attention was called to the caribou and how a certain culture was found throughout the whole range of these animals from Newfoundland to Bering strait. The dependence upon them was so marked that, if other phases of culture were ignored, we should take the caribou range as one culture area. Further, this culture shows some indications of being continuous with the reindeer culture of the Old World. The analogous use of bark for vessels,[1] the bark-covered tipi of Siberia, and the remarkably tipi-like tents of Lapland and Norway may have a common origin. The tendency has been to attribute all these similarities to the Arctic environment. It seems more likely that the distribution of the allied reindeer and caribou alone has been the chief factor and that, as such, has served as a diffuser rather than a creator of various associated traits. The suggestion is that a culture having once developed around the caribou or reindeer, as the case may be, mere expansion and diffusion would tend to carry it along, thus making the animal itself the accidental carrier of the culture. The historical view conceives that the real cause for the various traits being associated lies in the fact that they were at some former time and place so associated. Traits may thus be perpetuated so long as the faunistic or other conditions permit and it may yet turn out that certain paleolithic traits of reindeer hunters in the Old World were still to be found in Canada and Siberia a few hundred years ago.

DIFFUSION OF MATERIAL TRAITS

We have vaguely touched upon the question as to the nature of diffusion in material culture. It is clear that in many cases the borrowing of traits must be specific in that the whole cycle of processes is acquired. Thus, the taking up of the horse culture trait by the Indians of the Plains was more than the mere acquisition of the animal, for it consisted of many more or less closely related processes, as the care of horses, methods of harnessing, riding, packing, etc., also all the technique of riding and packing gear. In war and hunting there were special evolutions, not to mention other non-material practices. It is conceivable that different tribes could devise quite different ways of doing these things and that they could have taken over the trait complex to varying degrees; but we find great uniformity in all respects, so great that it is clear that the complex was taken over entire. We have here a splendid example because the essential facts are accessible. About the only changes the Indian made in the European horse traits were those necessary to adapt them to the materials and other conditions of his life; for instance, we find saddles after European models, but of Indian materials. All the essential concepts and techniques, however, were given to the Indian at once, these problems having been solved in the Old World.

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[1] Boas in Teit's Shushwap, (*c*), pp. 477–487.

We have made a special study of women's dresses and men's shirts among the Plains Indians to be published elsewhere, from which it appears that a uniform technological concept complex is distributed among many tribes. Tribal individuality appears only in decoration and a few inessential features, but even so is rarely restricted to a single tribe and tends toward a geographical rather than a random grouping.

Maize, as we have noted, carried with it a considerable technique and along with it went the cultivation of beans and squashes or melons; everywhere where we have data these plants were cultivated simultaneously and quite uniform methods of cooking them in mixed dishes have been reported. The remarkable uniformity of this complex should be noted, for it is here again found in one about whose diffusion there can be no doubt.

While not all the traits are so complicated as the examples just cited, the distinctly simple ones are so rare that we may legitimately consider all traits as true complexes. In like manner we might follow up the acorn complex of California, maple sugar, birchbark, camas, tipi, etc., each presenting its own special problems.

From these examples it appears that the tendency in material culture is not so much to profit by borrowed, disparate technological ideas as to take over whole complexes with all their concepts. This is in contrast to the observed condition in ceremonial traits as noted in the "pattern theory," or the tendency of a tribe to have a more or less fixed conception of its own according to which imported ceremonies are worked over.[1] The difference also serves to make clear that material culture is decidedly heterogeneous, or composed of disparate traits, whereas ceremonial culture is likely to be unified, or built around a fundamental idea. We see that in the main there is no evidence of functional relations between material traits or that they are controlled by any one concept. Further, in ceremonial traits the political units so far examined manifest decided individualities in their tribal pattern concepts, though the more objective aspects of the ceremonies themselves may be quite similar for all the tribes in a typical group, while in material traits such tribal individuality is wanting, so that it is doubtful if any of the political units in our centers can be truly credited with distinctive material cultures. It will be recalled that we once distinguished between these units by quantitative differences in traits rather than otherwise.[2]

Now, though material cultures taken as a whole lack tribal patterns, or individualized controlling ideas, they do tend toward specialization in the use of certain complexes, as we have noted above. In all such we have basic technological conceptions, but that such concepts dominate other technological processes is doubtful. Thus, in general literature we find the oft-repeated statement that copper is first treated as a malleable stone and so subjected to the general concepts for working stone. In a certain sense we have here a strange material subjected to a familiar technological pattern; but, if work in copper develops at all, we find it with its own distinctive cycle of processes and with its own basic conception. The suggestion from the preceding discussion is that instances of the new application of dissociated technological ideas cannot be cited readily and, further, that when they can they will be rather the extensions of technical processes already practised by a political unit than resultants of adapting borrowed ideas.

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[1] Goldenweiser, p. 606.

[2] Wissler, (*a*), p. 166.

Again we find examples like the following: In the Plains, especially in the northern half, buffalo were driven into pens or enclosures. This method was applied to antelope, also. In the Mackenzie area caribou were often driven into enclosures or through narrow lanes, which method extended even to the Eskimo of Alaska. On the east, the method was general among all the northern Algonkin tribes. It was also used in parts of the Plateau area. In this we refer to the very specific method of driving between fences into pens or lakes, for the mere process of surrounding or driving is too general to be significant. It is admissible that in the application of this process to several different species of ruminants we have a kind of pattern phenomenon, a hunting concept with continuity of distribution suggesting diffusion; but the method was nowhere exclusive and its adoption by a tribe did not require radical changes to make it conform to already established methods. Further, there are certain generalized concepts of wide application, like the pulverizing of food in mortars, which are far too fundamental for our restricted problem; but in the making of pemmican, the pulverization of dried salmon, and of dried roots in the Plateau area, we may again have the gross extension of a specific concept to new materials; but it is probable that here also we have only the application of the too generalized pulverizing concept. Anyway, the difficulty of analyzing such cases as these makes the result doubtful. Hence, it appears that the tendency in material culture is not so much to profit by borrowed ideas as to take over specific complexes: to take over one specific technological complex after the other and not to catch up from here and there disparate ideas, to be fitted into one or two unifying conceptions. This is rather in contrast to the conditions observed in ceremonial aspects of culture.

This point may be more concretely presented if we overstep the bounds of our subject and consider the forms of manufactured objects. So far we have held strictly to the limitations of our chapter and discussed the processes of production without regard to form and decoration. It is clear, however, that the form of utensils and other manufactured objects must have an intimate association with the processes. A long time ago Holmes demonstrated the influence of materials and processes upon form and decorative designs. In some cases we have the apparent carrying over of form patterns to other classes of objects, as gourd and bark vessel forms to pottery forms, water bottle forms to baskets, etc. Boas explains the angular baskets of the Plateau center as patterned after the boxes of the North Pacific area. One reason given is that it is difficult and awkward to make a coil basket of this shape and that it must have been suggested by some other form. The correctness of this interpretation need not concern us now, since we do find among some of the Coast Salish boxes and baskets of similar forms. The Tlingit and Haida, on the other hand, used round baskets and square boxes. As already noted there is some tendency in the Southwest to the same forms for pots and baskets, but such correspondences occur in few forms only. It is possible, though not altogether probable, that the oval wooden dishes of the Eskimo are copied from Déné oval bark vessels and likewise the angular stone kettles from bark kettles. Yet, we are here dealing with one class of objects, differentiated by materials and techniques, but underlying which is one and the same vessel concept in which there is certainly a form element. As previously noted, material culture is heterogeneous and without a unifying technological concept; hence, patterns can exist only for traits based upon the same concept and even then are subordinated in detail to the nature of the materials.

In short, the "pattern theory" as applied to ceremonial traits has no similar significance in material culture; but, there are technological conceptions that prevail over considerable geographical areas and which constitute patterns of a kind, though in no case does any one of these unify the material culture of a tribe.[1] We may conclude, then, that no significant functional connections exist among the material traits of a tribe; that between them are to be found no logical or other necessary associations, except in so far as their respective process cycles may happen to overlap, and that in consequence each trait complex presents its own distinct problem.

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[1] It should be noted that we are here dealing with tribal units and contrasting their respective reactions to ceremonial and material culture traits, and not with

In this connection we find ample justification for the methods of former years according to which single complexes like fire-making, skin-dressing, basketry, etc., were taken up individually and followed over very large areas without regard to the distribution of other traits. Also it is suggested that the proper method of approach is first to analyze the complex and determine the distributions of the various unit processes. Until this is carefully done for a few typical complexes, historical, genetic, psychological or other interpretations of the phenomena cannot have firm foundations, or make substantial contributions to the development of anthropology.

MOTOR FACTORS

It is in the productive processes of material culture that we should expect to find objective signs of functional motor differences between the several groups of men, if such differences are at all significant when operating in the culture level. In any event we have a field for the development of specific problems; for example, most Indians mount the horse from the right side; some tribes coil baskets in one direction, some in the other. Have such customs a true motor basis, or are they after all susceptible of historical explanations?

First let us note the Indian method of mounting the horse. So far as we know the habit of mounting from the right side was universal west of the Mississippi and according to Adair prevailed

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culture areas. The use of common materials affords a kind of process pattern, as the use of cedar, rawhide, etc., but in so far as this is a pattern it is environmental and not a part of one tribe's individuality. The present attitude in anthropology is to consider political and linguistic differences as synonymous with culture differences. In so far as these units have patterns of their own this is justifiable, but when we take up the study of the various culture traits involved, our boundaries become geographical rather than political or linguistic. This is particularly true of material traits.

among the tribes of the Southeastern area. From observation we know that in many parts of the west and southwest when Indians drive a wagon they turn to the left in passing, which is consistent with their method of mounting, for if one mounts from the right, the leader of a span must be the right-hand horse. Now, the universality of this custom among the Indians in contrast to Americans and Englishmen calls for an interpretation. Since we know that Indians are not left-handed in general, a physiological basis for the difference seems improbable. The horse culture of the western Indians came from the Spanish settlements and the same type of culture is noted by Adair in the Southeastern area, from which it follows that the striking uniformity of Indian horse culture is most satisfactorily explained by a single point of origin for all. Hence, it seems more likely that the observed uniformity in mounting is due also to historical causes and not in any way dependent upon obscure physiological differences. This does not give a final answer to the problem, since to give it an exhaustive treatment would require both historical as well as physiological and psychological research in several parts of the world.

In the direction of movement around a basket in twining or coiling we have a process in which there are but two possibilities. If we turn a basket of these varieties upside down and look at its bottom, the spiral of the elements will run either clockwise or anti-clockwise according to how the beginning was made. Kroeber has discussed the distribution of directions for coil basketry in California, without, however, reaching any conclusion as to its significance. So far as we know, no one has investigated the direction in twine baskets, where the problem seems less complicated. The usual method of handling a twine basket, as soon as the sides have taken form, is to rest it upright on the floor or lap, or incline it with the bottom next the weaver; at least this is the position shown in such photographs as we have seen. The long standing stiff warp makes this position necessary. On *a priori* grounds the tendency will be for all right-handed persons to move in a clockwise direction. The left hand will be used to hold the wefts in place as the right passes them through. We may, therefore, expect practically all twine baskets made by this method to show the same direction. Mr William A. Sabine checked up twine baskets in the collections of the American Museum of Natural History—241 twine baskets were examined, distributed from Alaska to the Rio Grande, and with the exception of the Aleutians, the clockwise direction was found in all but nine baskets. The twenty-five Aleutian baskets examined were all without exception anti-clockwise. This is to be expected because the Aleutians weave their baskets suspended in an inverted position, and hence weave downward. Then if they moved in the normal order, left to right, the twining would appear anti-clockwise when the basket was turned over. According to Mason[1] and Emmons the Haida wove baskets like the Aleutians, but we had at hand no authentic specimens. The Tlingit, on the other hand, seem to have woven their baskets in the usual way as the photographs by Emmons indicate.

Tlingit baskets present one peculiarity. Many of them have one direction for the bottom and another for the sides. In this case it is clear that the direction of movement was the same for both, since the smooth finish is on the inside of the bottom and on the outside of the sides. Hence, in our reading these baskets should be classed according to the outside direction. When so taken we have a total of ninety-six in clockwise direction and eight anti-clockwise. Unless some of the latter were made by suspension, they may be considered as the work of left-handed weavers. For one of these anti-clockwise baskets we have no locality, but the others are: Sitka, four, and Hoonah, three. This suggests that at least three women made these baskets.

Among other collections we have found but one specimen in which the direction of the sides changed: viz., Yurok (50.1–5968). We also found one other left-hand basket from the Hupa (50–5978).

It is now plain that the direction of movement in twine baskets is primarily a motor phenomenon, or determined by right-handedness, the actual direction of movement in relation to the weaver being always the same. Kroeber, on the other hand, found a somewhat different condition in coil baskets.[2] The process in coil is sewing rather than weaving. Here we may be sure that all right-handed women will operate the bodkin with the right hand and hold the basket with the left; but they can probably sew in either direction with equal facility. If the coil is toward the left hand, that hand will move along the rim of the basket ahead of the stitching or bodkin; but if toward the right hand, the left hand will move behind. The former will give us an anti-clockwise basket, the latter the reverse, when the bodkin is inserted from the outside of the basket. If the woman works from the inside, the directions will be reversed in our reading, but she is using her hands as before. This point is clearly shown in the plates to Mason's publication: No. 235, Pima, working from the outside, left hand ahead of stitching, basket anti-clockwise; No. 215, Hopi, ditto; No. 200, Havasupai, ditto; No. 198, Saboba, working from the outside, left hand behind stitching, basket clockwise; and No. 197, Mission, working from the inside, left hand behind, anti-clockwise.[1] The last two show the effect of changing from the inside to the outside.

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[1] Mason, (*b*), p. 415.

[2] Kroeber, (*b*), p. 49.

Now it is clear that whether a basket is worked from the inside or out, is of little significance in determining the direction of the coil, because the woman can work right-handed and still use either of the two possible directions. Here we have a chance for tribal patterns, unless the character of the materials or some other obscure factor favor one direction.

Kroeber states that the prevailing direction in California is anti-clockwise and elsewhere clockwise.[2] Yet in California he notes that some tribes change the direction with the form of the basket. The only tribes making all their coils in the same direction for all baskets are the Pomo (anti-clockwise), the Wailaki (clockwise), and the Yuki (clockwise). The Washo use the anti-direction but all the specimens were globular, or of one shape. As against these Kroeber notes the use of both directions by the Cahuilla, Maidu, Miwok, Yokuts, Mono, Mission, and Chemehuevi.

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[1] Mason, (*b*).

[2] Kroeber examined his baskets on the inside, hence we have transposed his terms to correspond with ours.

The possible explanations for the change of direction with shape, are limited. It seems unlikely that a woman would have two directions of stitching, when one would serve as well. It is almost certain that one of these directions will prevail in a tribe; hence, the most probable thing is that when baskets of both kinds occur in a tribe, in one class the bodkin is used from the outside, in the other from the inside. Since bottle-necked and many globular baskets cannot be sewed from the inside, it seems safe to assume that a tribe making these forms and using only one direction for all baskets works from the outside. Also that the direction of coil in such baskets gives us the key to tribal hand positions, where baskets vary in shape. Thus, the Pomo are certainly "left hand ahead";[1] but also are the Maidu, Miwok, and Washo; the Cahuilla, Wailaki, Yuki, Yokuts, Mono, and Mission appear as "left-hand behind."

In order to test these interpretations we examined a large series of Southwestern baskets. Here among the Apache, Pima, and Papago the bottle-necked are anti-clockwise, and flat and open-topped baskets clockwise. For the Pima and Papago we have field studies that show one prevailing tribal hand position for all baskets, left-hand ahead.

Checking up the coil baskets in the Museum, we found almost without exception all in the Eskimo, Déné, and Plateau areas to be clockwise, with no change for shape. However, except among the Eskimo and a few Déné, the wide open mouth is almost universal, permitting working from either side. Yet, in the Plateau area where imbrication is employed, the bodkin appears to have been used from the outside; hence, throughout we may expect "left-hand behind" position. In the Southwest, the position is "left-hand ahead." Thirty baskets from the cliff houses of Utah were also "left-hand ahead," all of them flat in shape and sewed from the inside. So far as this goes, the ancient and modern basketry of the Southwest is historically related.

The distributions of the two hand positions for coil basketry are now definable. From the Colorado river northward through the interior to Alaska one position prevails, the left-hand behind, or negative relation. A few Ojibway baskets we have seen are also negative. We can extend this distribution into Siberia, but it seems to end with the Russianized natives. South of the Colorado river the tendency is emphatically toward the opposite, or positive hand relation. Our check data for California agrees in the main with Kroeber's statements. Here we find the tribes in the central part also following the positive position, but the Shoshone and Mission Indians and also the Yokuts follow the negative. We have noted that the main body of the Shoshone use the negative hand position. Thus, our negative position area reaches the coast through southern California, separating the two smaller regions for the positive position. If it were not for this change in southern California we should have one continuous positive hand position area from central California to the Rio Grande and possibly southward.[1] When we recall the Shoshone peoples predominate in southern California, the possibility of cultural intrusion from the Plateau area is suggested. The Chemehuevi, for example, seem to practise both positions, or the basket-makers are divided into two classes, some following one mode, some the other. This tendency to vary is somewhat more in evidence among the Mission Indians than elsewhere, according to our specimens. Such mixture suggests that the tribes of southern California have been subjected to two influences. Thus, our problem becomes more complicated because on general principles the cultural independence of California basketry from that of the Southwest is open to question. Here is a real problem. We have, however, gone far enough to raise a strong presumption that a historical explanation will account for the observed differences throughout. The possible exception is the case of the Wailaki and Yuki in northern California, almost isolated by the twine-weaving tribes, and according to Kroeber using the negative position. They are in contact with the twine weavers on one side and the coil on the other. Unless they work all their baskets from the inside, they are certainly strong claimants for independence, though some contact with the Plateaus is not entirely impossible.

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[1] For confirmation see Barrett, p. 161.

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[1] No specimens were available to us south of the Rio Grande until we reach the extreme south of South America; here thirteen baskets all ran anti-clockwise, or like the Southwest.

In Africa we find a development of coil basketry somewhat comparable to that of America. We have not worked out the distribution so fully but find that the greater part of the Congo and South African baskets we have seen are anti-clockwise, but those from North Africa and parts of the West Coast are clockwise. Assuming that this holds for all African baskets, we have two very different races manifesting similar ranges of differences with respect to an identical motor process.

Thus, in the main, we have another example of the familiar continuity of traits, each hand position being rather definitely segregated and the whole offering an excellent opportunity to discuss the relative merits of independent invention and diffusion. Our present interest, however, is in the motor problem. In twine basketry, we saw that the direction of weave was fixed by right-handedness, and that Aleutian baskets were different from others because they were woven downward, the actual direction of movement being the same. This difference is therefore due to objective causes and not in any sense to be explained as due to motor differences in the Aleutians. In coil work, right-handedness controls the bodkin, but seemingly not the direction of movement. Some white teachers of basketry we have consulted say they teach the anti-clockwise coil because this position of the hands keeps the designs in full view. However, they believe that the sewing can be learned from one direction as easily as the other, but their experience is that when a person has learned in one of these directions, she will find it very difficult to change over to the other. Hence, we have a case in which an initial choice can be made according to objective rather than psycho-physical conditions. Yet we cannot make this conclusion positive, for many people feel that if the choice were left to the hands, the normal direction would be positive, or anti-clockwise.[1] Nevertheless, should this prove true, the adoption of another direction could scarcely be explained on motor grounds. Thus we are dealing with cultural phenomena and not with physiological or psychological phenomena. In another place we have suggested that there were levels, or cycles, in human activities between which there were no correlations. The suggestion in this discussion is that motor differences of an individual character are not likely to produce cultural differences. Also that when a motor element does function as a culture determinant, it is likely to be a general human characteristic and neither individual nor tribal, and so cannot be considered a cause of culture differences. We are all familiar with the vague assertions in psychological and anthropological literature that knowledge of elemental psychological differences is quite essential to the investigation of culture, but so far we have not observed any successful use of such knowledge. All our own experience has indicated that culture differentiation and psychological differentiation as now understood run in relatively independent cycles.

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[1] See also Barrett, p. 161.

We make no claim that this brief consideration of certain functional problems gives us final solutions, but it certainly does suggest that they are of minor importance. Everything so far seems to favor historical explanations for cultural differentiation.

SUMMARY

As stated at the outset, there has been in recent years no formative work in material culture comparable to that in art, mythology, and social and ceremonial organization. Our intent has been to show that this is in no way due to the nature of the phenomena, but that in material culture are to be found problems of the first importance. This is particularly true for North America where, so far as we now know, we deal with but one culture period comparable to the neolithic of Europe. This condition practically joins the archeological and ethnological methods, concentrating them upon a single group of problems. Nowhere else can we get so near to the objective aspects of man's entire cultural history. For some years now our dominant studies have been of a decidedly psychological character, the symbolic aspects of art, the conceptions and motives underlying the rituals of ceremonies, language, etc. All these prove for the time ever so much more fascinating than the description and distribution of technological processes, that the real problems in material culture are lost sight of. At the present moment attention is centered upon historical explanations for cultural similarities, which when objectified become chiefly discussions of observed geographical trait distribution. Yet, one difficulty in determining similarities in mythology, totemism, etc., is our inability to make sure of the reality of similarity. This is what lies at the root of the recent discussion of convergent evolution. Now, while similarities in material culture are not easily explained, their characteristics are objectified to such an extent that the determination of their relation is fairly simple.

This objective aspect of material culture offers opportunity for the application of experimental and scientific methods in as precise and definite a form as the various morphological sciences. In this respect it is on a par with anatomy. Every large ethnographical museum is a richly equipped laboratory, yet there has been a steady drift away from museums, some of our largest universities making practically no use of museum material in their work of instruction and research. It seems strange that in a scientific age our backs should be turned upon the one aspect of culture in which we find the experimental method in function, for modern science is most surely an outgrowth of material culture.

This brief examination of the subject has suggested the following problems:

1. The significance of continuity in the distribution of a trait.
2. The prevalence of diffusion and the relative rarity of independent invention in the essential trait elements.
3. The apparent unimportance of the motor and other functional elements of the cause-complex underlying a trait and the prime importance of the historical elements.
4. The significance of the geographical environment as a localizer, associator, or carrier of material traits; or as a continuity factor.
5. The origin and duration of the specific material centers for North America, primarily an archeological problem.

6. The analytical determination of the original elements in American culture, preparatory to inter-continental problems.

These problems are not here proposed as original with the writer, but as viewed from the somewhat unfamiliar horizon of material culture.

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